

C-QUAND

XRF ANALYZER

APPLICATION NOTE

HDS & BLENDING OPTIMIZATION WITH C-QUAND PLUS



"We monitor the Sulphur content in our fuels accurately to reduce cost and deliver according specifications. We found the C-QUAND PLUS having a very low OPEX and excellent repeatability"



CUSTOMIZED DESIGN TO POWER A LIFETIME OF VALUE

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The C-QUAND PLUS is a sensitive yet robust, easy to operate & maintain, continuous process analyzer which will enable the optimization of your HDS and blending units producing ULSG, ULSD and other Low Sulphur fuels. The C-QUAND PLUS allows for **accurate measurement, increased catalyst life, maximized production, and avoiding off-spec product.**

By applying Advanced Process Control (APC) to their HDS unit, refineries remove Sulphur in order to comply to regulatory standards (10 ppmW ULSD, ULSG and Low S Kerosene). Operation of the HDS unit depends on the performance of the HDS catalyst, the lifetime of which depends greatly upon the WABT (catalyst bed temperature). With its direct insight in feedstock composition, the C-Quand PLUS, allows for maximum span of control and optimal WABT settings.

Other known applications that requires a continuous Sulphur measurement analyzer, has to do with maximizing the use of the high Sulphur products during blending in order to control the Sulphur content as close as possible to specification.

KEY FEATURES

- Close to no maintenance
- Fully automated zero and span correction
- 24/7 support through remote access
- Repeatability better than 0.2 ppmW
- Various comms options (4-20 mA, Modbus TCP/IP, RS485)
- Long life SDD and X-Ray Tube (>5 yrs)
- Consistent with ASTM and ISO

Are the following your concerns?

Accurate measurement

The C-QUAND PLUS Analyzer, gives accurate, reliable data with a repeatability of less than 0.2 ppmW. Combined with the fully automated flushing, zero and span correction, it will be a reliable workhorse in your process

Increasing catalyst life by 3-4 months

For optimum results, refineries flow product to storage tank with a 24-hour averaged Sulphur level measurement. This allows for tighter control, by overcoming short-term process fluctuations.

The C-QUAND PLUS comes into its own in this type of application where its industry leading accuracy, long-term stability and continuous availability are key performance criteria for an analyzer.

The C-QUAND PLUS enables refineries to run their Sulphur levels closer to the allowable limit, saving energy costs as well as catalyst life. With a typical increase in catalyst life of 3-4 months achieved after increasing the Sulphur target from 7 to 8 ppmW, savings are significant!

Maximizing production

For plants that produce different product grades on the same HDS, it may take a few hours for the Sulphur level to settle after a transition. As the C-QUAND PLUS measures Sulphur level quickly, on-spec product is identified faster, maximizing production.

Avoiding off-spec product

The fast response and very high uptime of the C-QUAND PLUS will identify departure from specifications quickly, avoiding high associated reprocessing costs.

*For other applications (e.g. metals and Chlorine in crude), please refer to our other application notes, brochures, website or contact us!
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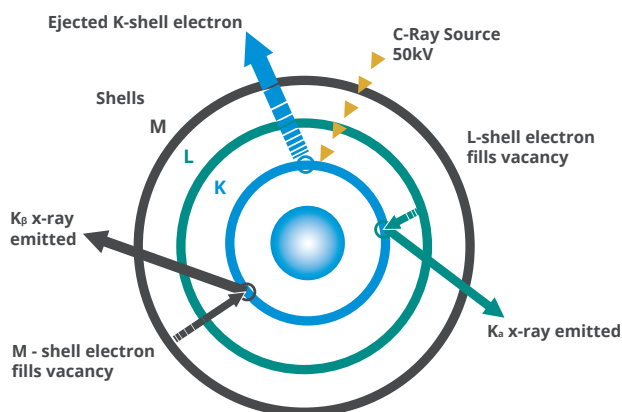
Our Technology

With over 40 years' experience with the design and engineering of online process analyzers, Hobré Instruments offers a turn-key total package solution tailored to your specific application. We can assist you at all phases (including maintenance, repair, troubleshooting, installation support, FAT/SAT, commissioning and start-up) to guarantee ongoing successful operation.

The non-destructive ED-XRF, X-Ray method has a long-proven track record in the industry for the measurement of Sulphur in refinery fuels. The technology delivers low OPEX costs with high availability (>99.5%). The C-QUAND PLUS analyzer offers excellent repeatability with the guarantee of drift-free measurement in the low (10 ppmW) concentration range.

X-Ray Fluorescence Principle

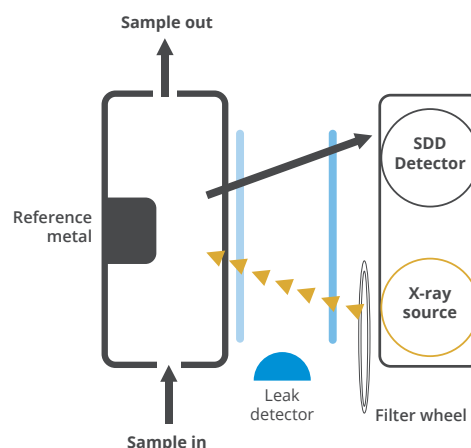
The C-QUAND has a powerful 15 watt, 50 kV X-ray source, with a silver anode. The X-rays displace the inner electron out from the K or L orbit of the atom, leaving a void. The now unstable atom will immediately fill the void with an electron from the outer orbits. The resulted reduction in energy is emitted as a photon with a very specific energy level unique to that particular element. The fluorescence is captured by a silicon drift detector (SDD).



Measuring Cell

The X-rays generated by the source are first filtered by one of six different optical filters. The X-rays then travel through a thin Beryllium window before hitting the actual sample.

The measuring cell is constantly flushed with fresh samples. Importantly, this method of measurement is continuous throughout the entire measurement, not just at the beginning. The measuring cell also contains a solid reference metal, which is used for automatic gain correction.



Not affected by addition of Biodiesel

Biodiesel contains FAME (Fatty Acid Methyl Ester). This can cause gel-like deposits in injection-based analyzer systems, causing blockages involving cleaning and the associated downtime. The C-Quand PLUS employs a continuous sample flow, avoiding FAME deposit issues.

Not affected by addition of Cetane improvers

Cetane boosters are often Nitrogen-based chemicals. These chemicals produce NOx, which give false high Sulphur readings under the UVF technique. Due to its technology, the C-Quand PLUS is unaffected by the addition of Cetane boosters in a blend.



SPECIFICATIONS

Measuring Range	0-10 ppmW; (higher ranges available upon request)
Repeatability	+/- 0,7 ppmW for 5 min avg. +/- 0,2 ppmW for 1hr rolling avg.
Measurement Standards	ASTM D4294, D7212, D2622 and ISO20847
Linearity	R=0,9990
Measuring Time	Freely adjustable
Density dependency	Not affected by fluctuations
C/H Ratio dependency	Not affected by fluctuations
Zero and Span Stability	Fully automated, zero and span correction
Installation requirements	Indoor installation recommended. To achieve specifications, we recommend to limit Temp. variations to +/- 5°C (41°F) Min-Max ambient Temp: 5°C - 40°C (41°F - 104°F)
Sample Outlet	Atmospheric to drain or to integrated Sample Recovery System
Sample recovery return pressure	Max. 7 barg (100 psig), (but ≤ available instrument air pressure) Design: 65 barg (943 psig)
Flushing solvent (container 1)	20L standard (Larger sizes available upon request)
Zero solvent (container 2)	20L standard (Larger sizes available upon request)
Estimated solved change interval	3 months
Mounting	Free standing frame included with delivery
Frame Dimensions	HxWxD=2155x775x580 mm
Required utilities	Power: 100-200W Instrument Air: 30 L/min (≥5 barg)



Headquarters

Network 4
1446 WK Purmerend
The Netherlands

+31 299 420871
Info@hobre.com

USA Sales & service

1400 N Sam Houston Parkway
Suite 158, Houston TX 77032
The United States

+1832 404 2760
infousa@hobre.com

For additional specifications, please
refer to the general brochure of
the C-Quand: WWW.HOBRE.COM



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