



Benefits of Vanta™ XRF Analyzers

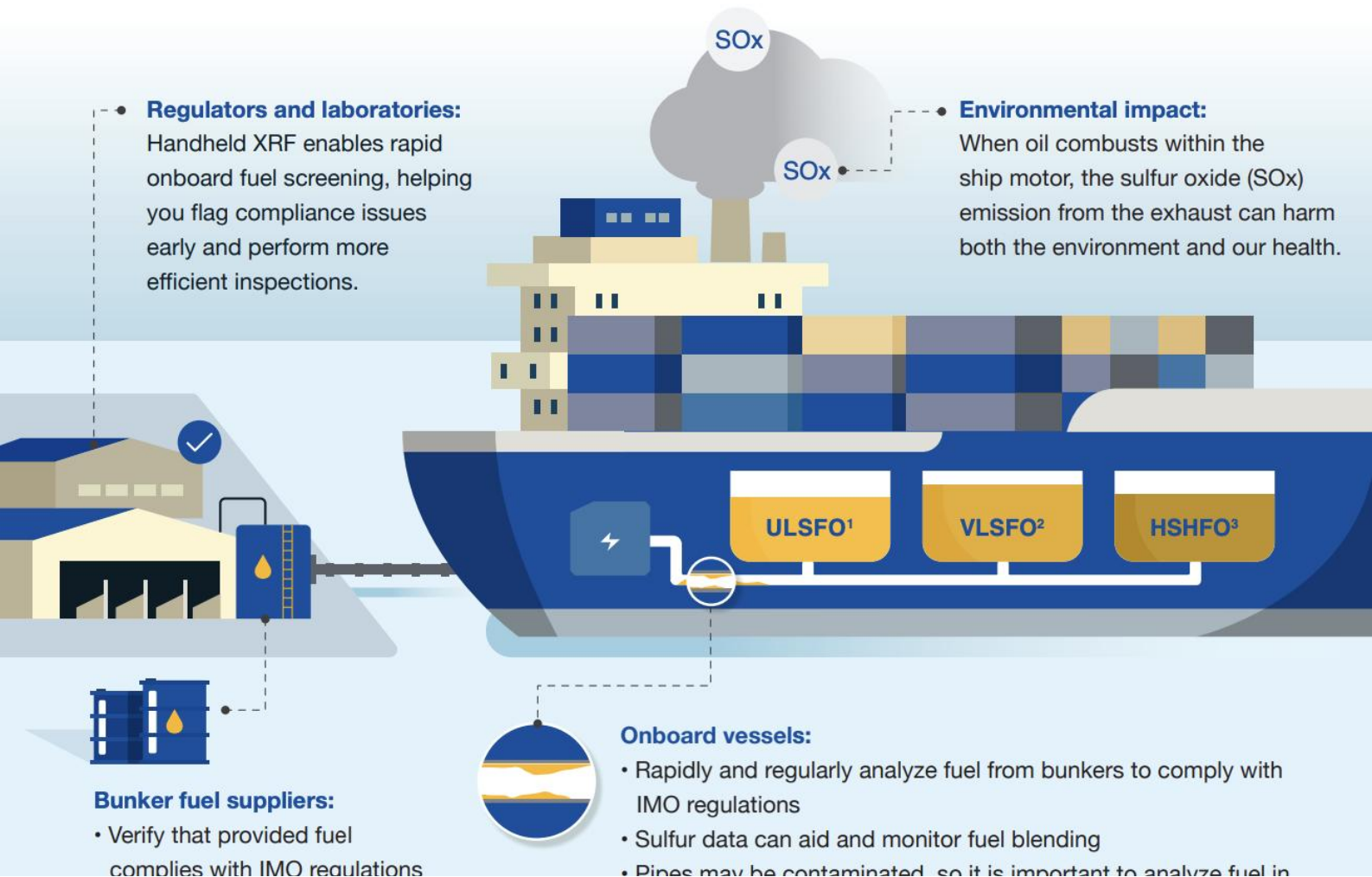
- Continuously operates at high temperatures up to 50 °C (122 °F)
- Accurate results from parts per million (ppm) to the percent level of sulfur
- Rugged (IP55/54 rated and MIL-STD-810G drop tested)
- Cloud capable for efficient fleet management from different vessels

SULFUR ANALYSIS OF MARINE FUEL OIL USING HANDHELD XRF

Handheld XRF is a rapid and accurate method to determine sulfur (S) concentrations in fuel oil. This information is vital to help ensure fuel oil complies with International Maritime Organization regulations. In addition, handheld XRF can aid preventative maintenance programs by identifying and quantifying wear metals in oil.

Due to the environmental risks posed by emissions from shipping vessels, the International Maritime Organization (IMO) has set regulations that limit the sulfur content in fuel. As of 2020, the latest regulatory update lowers the global cap on sulfur in fuel from 3.5% to 0.5%, while sulfur in fuel from sulfur emission control areas (SECAs) remains at 0.1%. The regulation covers oil used in both main and auxiliary engines, as well as boilers.

This regulation change leaves ship owners with little room for error and requires refineries to be more stringent in regard to fuel production and blending.



Sulfur Analysis of Marine Fuel Oil Using Handheld XRF

Handheld XRF is a rapid and accurate method to determine sulfur (S) concentrations in fuel oil. This information is vital to help ensure fuel oil complies with International Maritime Organization regulations. In addition, handheld XRF can aid preventative maintenance programs by identifying and quantifying wear metals in oil.

Due to the environmental risks posed by emissions from shipping vessels, the International Maritime Organization (IMO) has set regulations that limit the sulfur content in fuel. As of 2020, the latest regulatory update lowers the global cap on sulfur in fuel from 3.5% to 0.5%, while sulfur in fuel from sulfur emission control areas (SECAs) remains at 0.1%. The regulation covers oil used in both main and auxiliary engines, as well as boilers.

This regulation change leaves ship owners with little room for error and requires refineries to be more stringent in regard to fuel production and blending.

Olympus handheld XRF instruments rapidly analyze sulfur in oil while meeting international standards like ASTM D4294 and ISO 8754. Obtain on-site results at multiple locations from the refinery to the ships.

Onboard vessels: It is common to have multiple bunkers containing oil of different specifications, such as ultra-low sulfur fuel oil (ULSFO)¹, very-low sulfur fuel oil (VLSFO)², and high-sulfur heavy fuel oil (HSHFO)³. Since pipes from the bunkers to the engines or boilers may be shared at certain junctures, the oil can become contaminated before reaching the engine or boiler. Handheld XRF provides vessel personnel and surveyors with the flexibility to analyze oil from multiple locations between the bunker and the engine or boiler.

Regulators and laboratories: Handheld XRF provides regulators and laboratory staff with a fast, cost-effective way to screen oil samples onboard the vessel before selecting ones for further lab analysis.

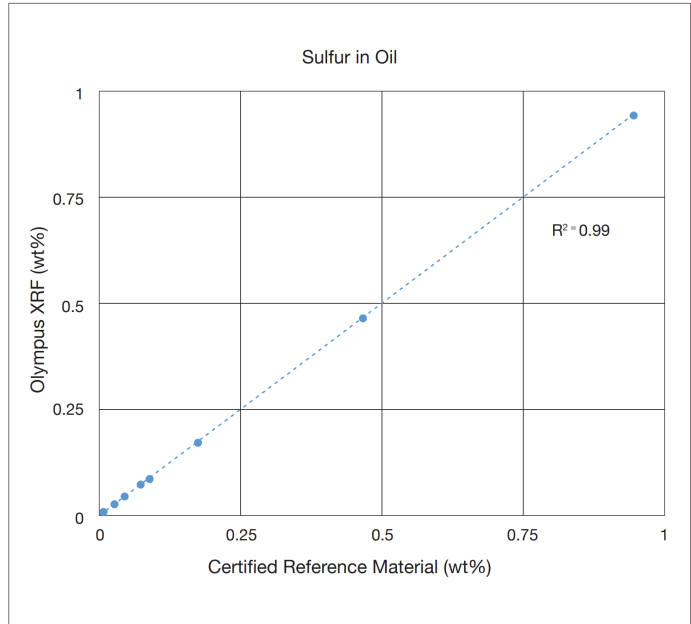
Suppliers to vessels: The supply chain from the refinery to the bunker can be long, complex, and vary dramatically. As a result, the final product is often a blend of oil from multiple sources. Performing regular checks at the port or after blending helps ensure that incoming oil is compliant with the IMO regulations.

Analyzing wear metals in oil for preventative maintenance: Early identification and quantification of wear metals in oil is critical in preventative maintenance programs. Regularly analyzing oil samples with brief tests can help you avoid expensive damage and downtime to critical mechanical components. Table 1 below shows a list of common wear metal elements and their typical sources on a vessel.

Olympus handheld XRF instruments enable you to routinely analyze wear metals in oil with a wide concentration range from ppm to the percent level. Our XRF technology can also be automated for in-line (or online) oil analysis.

Table 1.

Wear Metals	Common source of wear metals onboard a vessel
Iron (Fe)	Cylinder liners, pistons, gears, stern tubes, and hydraulic systems
Copper (Cu)	Cylinder liners, pistons, bearings, stuffing box, gears, and hydraulic systems
Chromium (Cr)	Cylinder liners, pistons, gears, stern tubes, and hydraulic systems
Lead (Pb)	Cylinder liners, pistons, gears, stern tubes, and hydraulic systems
Silver (Ag)	Trunk piston engine bearings
Molybdenum (Mo)	Trunk piston engine cylinder liners, piston/piston rings
Nickel (Ni)	Fuel contaminant
Vanadium (V)	Fuel contaminant
Zinc (Zn)	Lubricant additive
Calcium (Ca)	Lubricant additive



Benefits of Vanta™ XRF Analyzers

The Olympus Vanta XRF instrument enables operators to analyze a range of coated materials in the warehouse or yard quickly and nondestructively. Features include:

- Continuously operates at high temperatures up to 50 °C (122 °F)
- Accurate results from parts per million (ppm) to the percent level of sulfur
- Rugged (IP55/54 rated and MIL-STD-810G drop tested)
- Cloud capable for efficient fleet management from different vessels



Related Product



Vanta Max and Core

The Vanta™ handheld XRF analyzer series provides rapid, accurate elemental analysis and alloy ID in two powerful models. The Vanta Max analyzer offers the series' highest analytical capabilities for robust applications, including mining exploration, mineral analysis, soil testing, and environmental analysis. The Vanta Core analyzer is the standard choice for fast alloy ID. Comfortable to hold, easy to use, and durable, the analyzers maximize efficiency in the field and lab.

[Learn More ▶ https://www.olympus-ims.com/vanta/](https://www.olympus-ims.com/vanta/)