# Cylinder Lube Oil

## Testing & Analysis

VISWA LAB

## Why test the used cylinder lube oil?

Cylinder lube oils are by far one of the most expensive consumables onboard a vessel. These lube oils are primarily meant to lubricate the combustion chamber and neutralize the corrosive acids of combustion that may prove to be detrimental to the entire main engine system. These lubricants are formulated with significant amounts of detergent and dispersant additives. The choice of dispersants and detergents affect the speed of acid neutralization, formation of deposits and thermal properties of lubricants. Hence, a drain oil analysis helps to provide a snapshot of the exact condition of the engine system at the time of sampling. Some of the potential outcomes of cylinder drain oil analysis are;

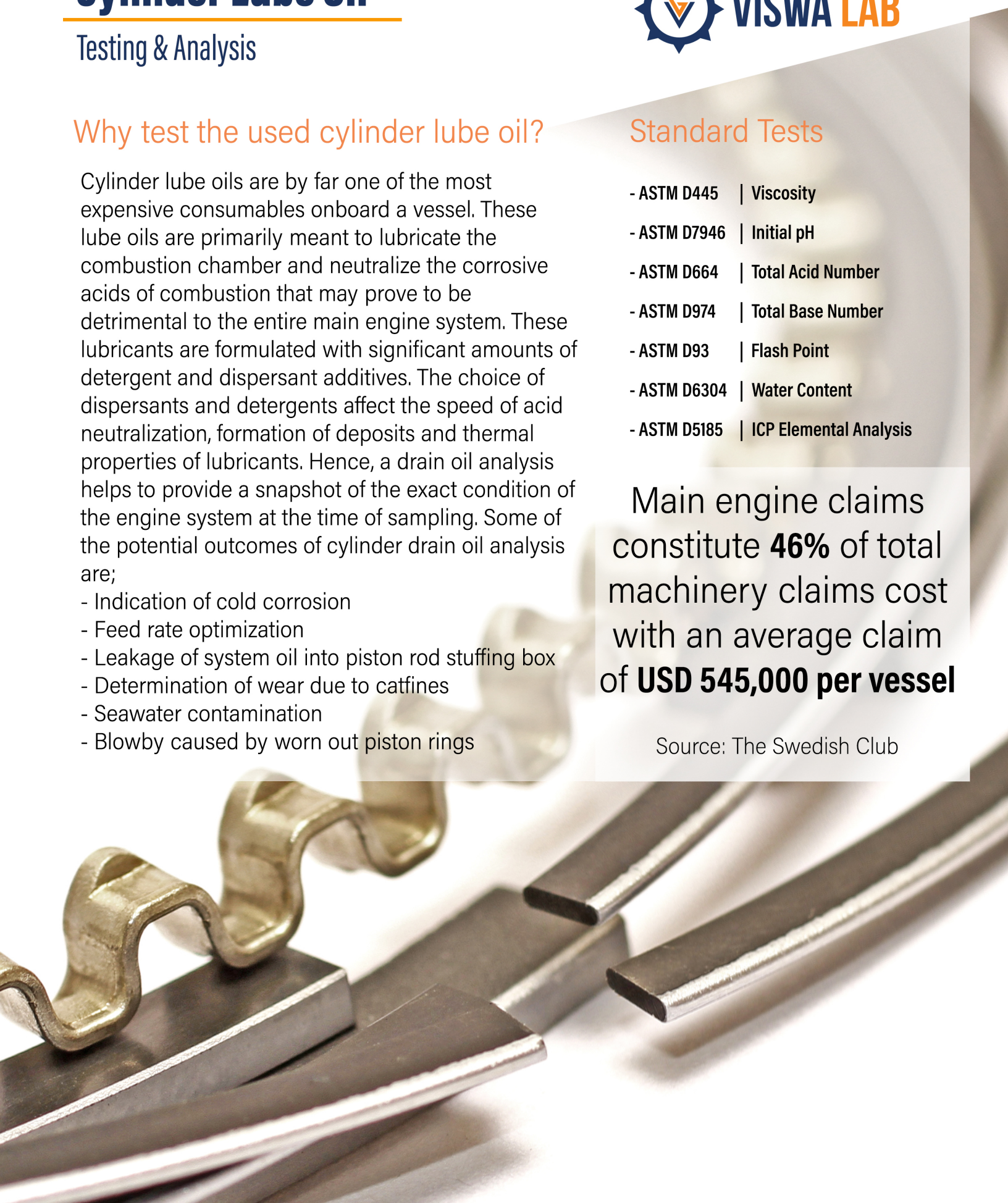
- Indication of cold corrosion
- Feed rate optimization
- Leakage of system oil into piston rod stuffing box
- Determination of wear due to catfines
- Seawater contamination
- Blowby caused by worn out piston rings

## Standard Tests

- ASTM D445 | Viscosity
- ASTM D7946 | Initial pH
- ASTM D664 | Total Acid Number
- ASTM D974 | Total Base Number
- ASTM D93 | Flash Point
- ASTM D6304 | Water Content
- ASTM D5185 | ICP Elemental Analysis

Main engine claims constitute **46%** of total machinery claims cost with an average claim of **USD 545,000 per vessel**

Source: The Swedish Club



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## AN vs. pH - The Importance

The acid number of an oil is used to analyze the acidic contamination, additive depletion and oxidation. It is determined by the amount of Potassium Hydroxide (KOH) base required to neutralize the acid in one gram of sample. Although this standard test can detect both the weak organic acids & strong inorganic acids and the Total Acid Number (TAN) can determine the acid concentration, this test still fails to reveal the actual strength of the acid. Hence, it fails to determine the actual corrosion potential of the oil. Advising on the condemning limits also becomes a problem with TAN because of the characteristic differences between trending behavior of oils.

In order to overcome this, we at Viswa test for pH along with the TAN. Since the corrosion of acids is caused by the Hydrogen ions (H+) present, the measure of their concentration will give a clear picture of how corrosive the oil is becoming.

## Advanced Analysis

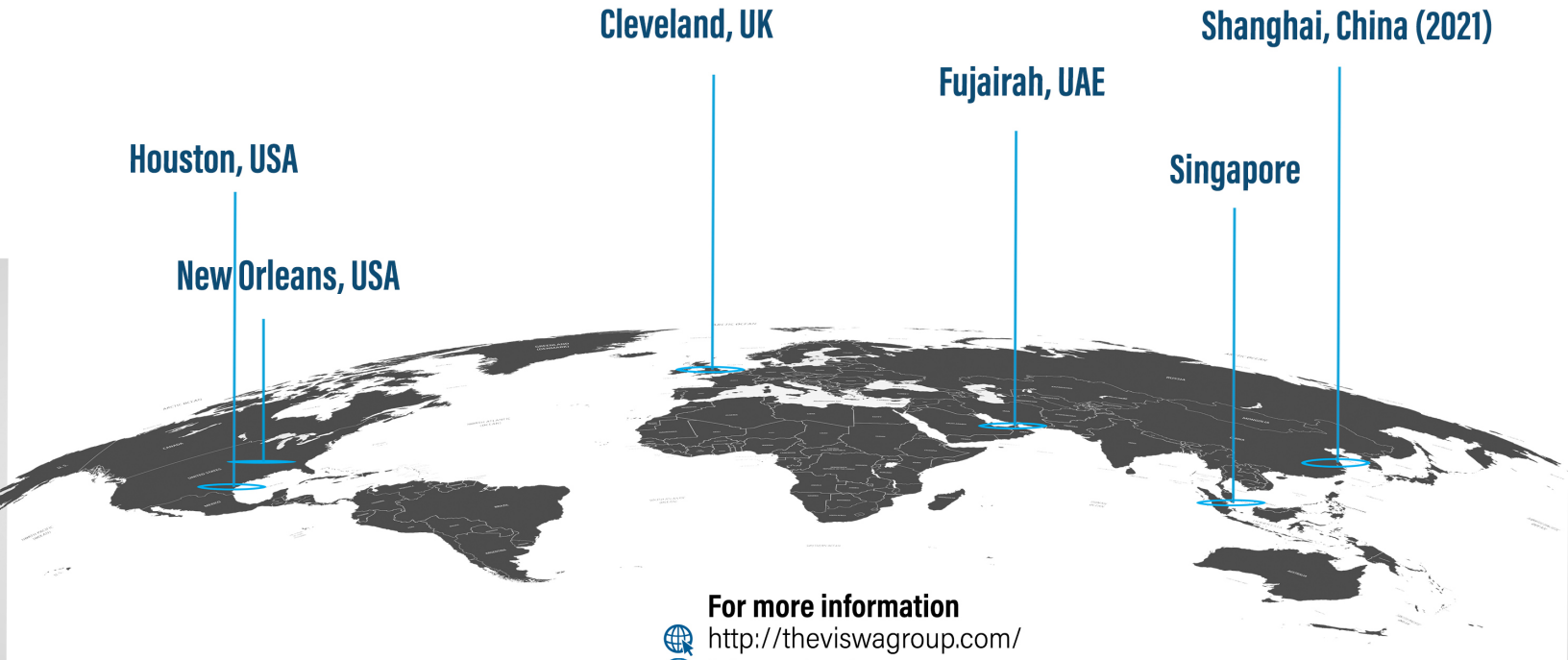
**Analytical Ferrography**

This technique is used to systematically analyze the suspended wear debris and other solid contaminants to determine the root cause behind abnormal wear and failure.

**Blotter Tests**

This inexpensive test has a high potential to determine the amount of insolubles present and the condition of the dispersancy additive. Other significant use of this test is to determine the contamination due to fuel oil and water.

***Viswa's white paper on pH being a better indicator of acidity than conventional base number has been accepted and published in MER (Marine Engineers Review). The latest whitepaper addresses the current issue of excessive liner wear caused by VLSFO.***




**For more information**

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