Experimental Investigation of Sulfuric Acid Condensation and Corrosion Rate in Motored Bukh DV24 Diesel Engine - DTU Orbit (20/10/2019)

The work conducted in this paper presents a novel experimental setup to study sulfuric acid cold corrosion of cylinder liners in large two-stroke marine diesel engines. The process is simulated in a motored light duty BUKH DV24 diesel engine where the charge air contain known amounts of H₂SO₄ and H₂O vapor. Liner corrosion is measured as iron accumulation in the lube oil. Similarly sulfuric acid condensation is assessed by measuring the accumulation of sulfur in the lube oil. To clarify the corrosive effect of sulfuric acid the lube oil utilized for experiments is a sulfur free neutral oil without alkaline additives (Chevron Neutral Oil 600R). Iron and sulfur accumulation in the lube oil is analyzed with an Energy Dispersive X-Ray Fluorescence (ED-XRF) apparatus. Three test cases with different H₂SO₄ concentrations are run. Results reveal good agreement between sulfuric acid injection flow and the accumulation of both iron and sulfur in the oil.

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Contributors: Kjemtrup, L., Cordtz, R. F., Meyer, M., Schramm, J.
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