

Wear Particle Analysis from used Gear Lubricants for Maintenance Diagnostics

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Abstract : This particular work describes an experimental investigation on gear wear in which wear and pitting were intentionally allowed to occur, namely, moisture corrosion pitting, acid-induced corrosion pitting, hard contaminant-related pitting and mechanical induced wear. A back to back spur gear test rig and a grease lubricated worm gear rig were used. The tests samples of wear debris were collected and assessed through the utilization of an optical microscope in order to correlate and compare the debris morphology to pitting and wear degradation of the worn gears. In addition, weight loss from all test gear pairs were assessed with utilization of statistical design of experiment. It can be deduced that wear debris characteristics from both cases exhibited a direct relationship with different pitting and wear modes. Thus, it should be possible to detect and diagnose gear pitting and wear utilization of worn surfaces, generated wear debris and quantitative measurement such as weight loss.

Keywords : predictive maintenance, worm gear, spur gear, wear debris analysis, problem diagnostic

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