

Dynamic Image Analysis of Fuels and Lubricating Oils for On-Line Detection of Contaminant Solids and Water

Colin Dalton, JM Canty, Dublin, Ireland
Tod Canty, JM Canty
Paul O'Brien, JM Canty

Abstract:

"Dynamic Image Analysis of Fuels and Lubricating Oils for On-Line Detection of Contaminant Solids and Water"

Imaging techniques for characterizing particles and water in turbine fuels and lube oils can be a valuable tool for maintaining rotating and reciprocating equipment and extending operational life cycles. Traditional particle analysis methods are often limited to off line lab environments where a process sample is taken to a lab and timely control is difficult. Sampling and analyzing at line is only marginally better. These methods do not provide continual analysis of the oils and cannot yield information about particle shape and surface morphologies which can be critical in determining the source of contamination in the oils. Vision based systems lend themselves well to examination by the operator which reduces the likelihood of characterization errors and enhances reproducibility, repeatability and accuracy. The visual capability allows the user to input his or her knowledge of the process to work in making meaningful analyses decisions. Imaging filters can be applied to the analysis that can distinguish solids from water droplets thereby doubling the capability of the instrument over non visual equipment which cannot make this distinction. This paper describes a vision based system used for particle sizing that provides a true 2-dimensional size and shape analysis. The paper also discusses the fundamentals of a vision system that allow for accurate and repeatable analysis of a wide range of processes.