

TEST EQUIPMENT CONSIDERATIONS FOR WATER AND ALCOHOL PHASE SEPARATION DETECTING FILTERS

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ABSTRACT

Several different companies manufacture filters that are designed to detect the presence of water in a medium or to detect when phase separation of a gasohol has occurred. Detection of water or phase separation in a gasohol causes the flow through the filter to drastically reduce and the differential pressure builds. Both the reduction in flow and the increase in differential pressure can be used to alert an operator of water contamination issues.

To date, there is no industry wide standard to test these filters. Each company tends to author its own test procedures and then have the test procedures implemented by an independent laboratory. There is some crosstalk across the industry and so each company's test roughly resembles the other companies. However, to make the test data more meaningful and to make meaningful comparisons, an industry wide standard is needed. To begin, the test equipment must be standardized.

The test equipment consists of plumbing which should be made of fluid compatible materials. Temperature control of the fluid is critical and this is one item that is not found in all test equipment. Flow meters, differential pressure gauges, and temperature measurement devices need to be made of fluid compatible materials and these instruments should be operable over the expected range of values. As a final consideration is the test fluid reservoir size. Most of the test equipment has a small reservoir size that is typically less than ten gallons. The data indicates that too small of a reservoir size leads to fluid overheating and too much water stripping from the test fluid by the water detecting filter. This leads to larger variance in test results.

As a final consideration, there is some accessory equipment that is needed. Equipment is needed to detect the initial water concentration in the test fluid so that this can be added to total amount of water contamination added. Most of the test equipment used today skips this step because the initial water can be very low or made very low. However, when considering gasohols, especially ethanol blended fuels, the amount of initial water can be significant. For testing alcohol phase separation detecting filters, equipment is needed to check the alcohol content of the gasohol and for determining the amount of alcohol that drops when phase separation occurs.

BIOGRAPHY, SHORT SKETCH

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