



Witnessing of Tan Delta OQSxII Sensor Tests – Executive Summary Overview Report



Tan Delta Systems

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EXECUTIVE SUMMARY

Tan Delta Systems requested that TÜV SÜD witness the execution of three test procedures:

- TM023.02 Wear Metal Sensitivity [1]
- TM024.04 Fuel Dilution [2]
- TM025.03 Oil End of Life Tracking and repeatability [3]

Detailed results for each test can be found in the reports:

- 2024_602 Tan Delta Systems TAD001 Wear Metal Sensitivity Report Revision 1 [4]
- 2024_603 Tan Delta Systems TAD001 Fuel Dilution Report Revision 1 [5]
- 2024_604 Tan Delta Systems TAD001 End of Life Test Report Revision 1 [6]

This report is a concise description of the outcomes, of each test.

TM023.02 WEAR METAL SENSITIVITY

The results of the wear metal tests clearly demonstrated the ability of the sensor to precisely, accurately and repeatedly detect the presence of 50 ppm wear material (0.005 %). Providing clear evidence that the sensor will detect very small amounts of wear material thereby giving clear insight into the condition of an asset and providing an early warning of any potential issues which could develop into premature failures. The extremely low co-efficient of variation of <0.1 % during the tests was indicative of a very precise and repeatable instrument.

TM024.04 FUEL DILUTION

For the fuel dilution test the sensor again performed very consistently when measuring various levels of fuel dilution. The data from the individual tests clearly demonstrated the ability of the sensor to detect the presence of unburnt fuel in lubricating oil in a precise fashion. The relationship between actual and measured dilution levels at the other test points being almost linear R^2 value of 0.9999 over the range 2 % to 10 % and R^2 value of 0.9964 over the range 0 % to 10 %. The extremely low co-efficient of variation of 0.11 % during the tests was indicative of a very precise and repeatable instrument.

TM025.03 OIL END OF LIFE TRACKING AND REPEATABILITY

During the end of life test the sensor performed very consistently when measuring the various new to aged oil mixtures with an almost perfectly linear relationship between the sensor Tan Delta Number (TDN) and the amount of end of life oil used, proving that the sensor can provide a very reliable and accurate indication of overall oil condition during the oil's entire lifecycle from brand new to end of life, allowing safe and reliable condition based oil changes. The sensor performed very consistently when measuring the various oil mixtures with an almost perfectly linear relationship between the output from the sensor – Tan Delta Number (TDN) – and the percentage of EOL oil in the mixture with an R^2 value of 0.9982 over the range 0 % to 100 %. The low co-efficient of variation of 0.4 % during the tests was indicative of a precise and repeatable instrument.



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REFERENCES

- [1] TM023.02 Wear Metal Sensitivity
- [2] TM024.04 Fuel Dilution
- [3] TM025.03 Oil End of Life Tracking and repeatability
- [4] 2024_602 Tan Delta Systems TAD001 Wear Metal Sensitivity Report Revision 1
- [5] 2024_603 Tan Delta Systems TAD001 Fuel Dilution Report Revision 1
- [6] 2024_604 Tan Delta Systems TAD001 End of Life Test Report Revision 1



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Contributor(s)	Printed Name(s)	Signature	Date
Author(s)	Colin Lightbody		18/10/2024
Reviewer(s)	Calum McLaughlin		18/10/2024
Authorised by	Marc Laing		18/10/2024



Partner with us today

Point of contact: Colin Lightbody

Email: colin.lightbody@tuvsud.com

Web: <https://www.tuvsud.com/en-gb/industries/chemical-and-process/flow-measurement>

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TUV SUD Limited.

Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom.
Registered number. 5C215164.

TUV SUD Limited is a
TUV SÜD Group Company

Tel: +44 (0) 1355 593 700
Email: info@tuv-sud.co.uk
www.tuv-sud.co.uk

TUV SUD Limited
Scottish Enterprise Technology Park
East Kilbride
Glasgow, G75 0QF
UK