THE FAUDI GUARDIAN

FAUDI aviation

HDD vs. RDD

Comparison of FAUDI Hydrophobic Barrier (HDD) and Retaining Dirt Defence Filtration (RDD)

Which drop-in technology can prevail from an economical perspective?

FAUDI Aviation Dirt Defence Filter (DDF) water handling properties lead to opportunities for the industry.

From data shared in a presentation by JIG at the EI Filtration Seminar in 2019, it can be seen that water handling characteristics of a filter monitor and a FAUDI Aviation Dirt Defence Filter are similar.
A series of tests were conducted on the FAUDI Aviation test rig in Germany, to prove the field data and usability. Test results showed that the FAUDI DDF element together with an AFGUARD®, appears to have similar, if not higher, water holding capabilities than a filter monitor.

A regeneration run restores performance, whereas a filter monitor would have triggered the dp switch and required a replacement set of elements. It is possible to regenerate the FAUDI DDF elements and reuse several times. 'Regeneration ' is described in JIG Operations Bulletin No. 130: *'The filter shall be flushed for at least 5 minutes at the maximum achievable flow rate, preferably on a test rig or by recirculation through fuellers if no test rig available'.*

What does this mean for different drop-in solutions for FM vessels?

Reminder: Jet fuel at point of delivery into aircraft contains predominantly no free water or particulate!

Download the factsheet here:

Water in Jet Fuel Misconception:
www.faudi-aviation.com/factsheet-03-2020/
JIG Operations Bulletin 130:
www.jig.org/documents/bulletin-130-08-2020/

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Hydrophobic Dirt Defence (HDD) - a water repelling barrier, additional to filtration.

FAUDI Aviation considered developing a Hydrophobic Dirt Defence (HDD) filter element. Various combinations of filter materials and water barrier media were tested, but found:

- To effectively hold back water, the water barrier layer porosity would need to be so low, as to cause a micro-solids loading problem, i.e. very short service life.

- A standard paper or just hydrophobic jacket does not have the capability to reduce water in small droplet emulsions.

- Contained water does not efficiently shed to the vessel sump and remains within the filtration media. Although the principle of surface coalescing on a hydrophobic barrier would result in the water falling to the vessel sump, testing proved that at low ppm levels, water blocks the hydrophobic barrier before sufficient build-up to shed. This causes the element to reach the changeout differential pressure.

- These findings demonstrate that the technology is not suitable for use in the real world and does not meet the requirements of our customers. The exact conditions under which it must perform in the field were found to fail on the test rig.

Conclusion: FAUDI Aviation does not believe there can be an acceptable balance between operational life and water repellency with this principle of technology. Following consideration of our own data along with the data presented at the EI Filtration Seminar in March 2021 on a similar technology, the operational life has proven very short. It is therefore unlikely that a commercially viable product could ever be developed and consequently FAUDI Aviation ceased work on this project for the time being.

Project postponed!

Water Retaining Dirt Defence (RDD) - a filter with water retaining properties, additional to filtration.

While testing for an RDD and reviewing data and usability from the various field trials, it was clear that FAUDI DDF element has inherent water retaining characteristics:

- Water content upstream and downstream of a Dirt Defence Filter vessel will differ since the filter media retains water. In the very rare case of water at the inlet, it is retained in the FAUDI DDF element, while allowing as little as 1ppm water downstream.

- In case of a 15ppm warning, reducing the flow rate for the remainder of the fuelling would reduce the chances of a second warning before the fuelling is completed. Tests have proven that should water be present, operating at 50% of flow results in the water being retained.

- A short regeneration cycle on the test rig restores the water retaining capabilities of the FAUDI DDF element. Testing with repeated cycles over a number of days demonstrated that upon each regeneration, water retaining performance was refreshed.

Conclusion: In the extremely unlikely event of a warning from Electronic Water Sensor it is possible to complete the refuelling, with flow rate management. Thereafter a regeneration run restores performance whereas a Filter Monitor would have triggered the dP switch and a replacement set of monitor elements required.

Field operational data corroborates test rig findings.

Improved life-cycle perspective and sustainability through multiple regeneration and 5-year changeout!

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