Driven by emission reduction measures, ever increasing amounts of combustion by-products, the so-called soots, are released into the lube oil. As soot builds up the oil’s dispersant package is no longer capable of keeping the soot in suspension. The soot agglomerates and falls out of suspension, forming sludge. Sludge in turn interferes with the desired functioning of the oil. It also becomes somewhat abrasive in the system and plugs filters. Removing sludge forming materials from the system allows oil to perform effectively for longer.

A Centrifuge relies on the centrifugal forces created by the rotation of the rotor. In the case of an engine centrifuge, the centrifugal “G” forces are achieved by driving the rotor in circular motion on its axis with pressurized oil from the lube system. When the pressurized lube oil exits the rotor vessel from the nozzles at the bottom, the rotor spins, similar to a lawn sprinkler. The “G” forces generated by the rotation separate the contaminants from the oil to cake up on the wall of the rotor. The captured contaminant, predominantly soot, is then held inside the rotor and disposed of with the rotor at scheduled filter, rotor and oil change intervals.

Conventional centrifuge rotors had empty rotor shells with a low separation efficiency. That is because the particles have to travel a long way away from the centre towards the outer shell of the rotor vessel where the centrifugal forces are greater.

Modelling with computational fluid dynamics software showed that the oil flowing through a conventional rotor “hugs” the centre hub, rather than sweeping towards the outside of the rotor shell.

By incorporating a stack of cone shaped dishes into the rotor, (ConeStac) the oil flow is directed to the outer circumference of the rotor vessel, where the “G” forces are greater and the particles can be removed more efficiently.

Further research developed the Spiratec technology, where the entire cone stack is replaced by a unitary molded spiral vane module, whilst retaining the advantage of reduced sedimentation distance for increased efficiency.

Spiratec technology enables a significant reduction in lube oil scavenging from the by-pass circuit. Engines with low oil pressure that can only afford small amounts of oil being diverted to the by-pass lube circuit, can now operate a centrifuge.

Fleetguard Centriguard Filters CH41111 and CH41112 that previously suited engines capable of by-pass flow rates of 2 GPM (8 lpm) are now available with Spiratec rotors.

For 1 GPM (4 lpm) flow rate use CH41113 and CH41114 which utilises rotor CS41016.

Alternatively, existing CH41111 and CH41112 centrifuges can be retrofitted to the rotors with lower by-pass flow rates by installing CS41016 rotors.
Fleetschool Fact Sheet

These and other Fleetschool Fact Sheets can be found on the Fleetguard Website at:


TEST YOUR KNOWLEDGE

1. Which contaminant is predominantly removed by a centrifuge?
   A. Soot   B. Wear Metals   C. Core Sand

2. What do the improved technologies of ConeStac and Spiratec have over conventional, empty rotors.
   A. They spin faster   B. They hold more soot   C. They have a greater separation efficiency

3. How can you reduce the by-pass oil flow to drive a CH4111 centrifuge by half without losing separation efficiency?
   A. Install a throttle value   B. Install a CS41016 rotor   C. Install a CH41112 centrifuge

ANSWERS