

CHECKING AIRCRAFT HYDRAULIC SYSTEMS USING SPECTREX PC-2200 LASER PARTICLE COUNTER

TAP Portugal is using the Spectrex particle counter.

The main functions for Aircraft Hydraulic Systems are to provide required power to hydraulic units which are, for example: Actuators of flight control surfaces (e.g. ailerons, elevators, spoilers, flaps, breaks, etc.), Landing gear systems, Thrust reversers, etc.

The type of Hydraulic fluids used in aircraft systems must meet high levels of performance capabilities, including stability for high temperature ranges, low density and rust protection. Periodically Hydraulic fluid must be monitored by laboratory analysis to control a wide number of parameters: viscosity, density, TAN, water content, particle contamination, etc. For TAP Portugal, all this analysis is performed in our Chemical Physics Laboratory using a wide number of techniques and equipment. Depending on fleet type, all the hydraulic fluids are sent to our laboratory depending on Flight Hours (FH), and defined by Maintenance Planning Documents (MPD).

One of the main physical properties of Hydraulic fluid must be the absence of particles (measured in micrometer diameters and number per ml) and this control is made by using the Automatic Particle Counter (PC-2200), made by Spectrex. For each aircraft we have three different kinds of samples, each one related to the three independent hydraulic systems of the aircraft: green, blue and yellow.

Due the importance of these parameters and the need for results in a short period of time, we find the Spectrex APC to be invaluable. It is easy to use, user friendly for operators and gives us high reproducibility of results. The calibration of the unit is simple, using sealed calibration standards, as is the sample preparation. Thus the analysis can be run in just a few minutes. Quality control is maintained for when the results are out of range this would mean a total replacement of hydraulic oil for the system analyzed. The use of the Spectrex APC allows us to perform preventive maintenance before more serious problems arise.

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