

Pacific 2001 Cessna Aircraft Sampling Procedure for VOCs Using Canisters

The sample collection procedure was as follows.

- 8 evacuated canisters were securely mounted in a special pod that was located under the belly of the aircraft.
- Via small sections of 3mm OD stainless steel tubing these canisters were connected to every second port of a 16-port multi-position valve (Valco model EMT4SD16MWE; this valve is driven by an electrical motor moving sequentially to the next port, and has 3mm OD fittings).
- Before take-off all SS sections between the canisters and the multi-position valve were sequentially evacuated upon which the canister valves were opened.
- At this time the multi-position valve was positioned at port #1; all odd numbered ports were connected to a single Venturi to keep the lines continually flushed during a flight.
- A sampling pump (KNF model UN022STP) was located upstream of the multi-position valve. The intake port for sampling ambient air was facing backwards and was located under the portside wing of the (single engine) aircraft. While the intake line was made of 6mmOD PFA Teflon, all parts from the pump onwards were made of 316 stainless steel.
- The pump was turned on after take-off and operated during the whole flight, thereby keeping the lines continually flushed with ambient air.
- Since there was no operator on board, the pilot would push a button that would start an automated sampling procedure whereby the multi-position valve would move to the next even-numbered port, the canister would be pressurized with ambient air for a preset time interval, and then the multi-position valve would move to the next odd-numbered port. The overall procedure was controlled by a Campbell Scientific model CR10X controller.
- Concurrently with the start of the sample collection procedure, a time marker was entered on the aircraft data system to indicate that a canister sample was collected. All time and position data refer to the aircraft DAS; time information from the CR10X was only used to facilitate the matching of aircraft DAS and multi-position valve port number (and hence canister ID).
- After a flight the canister valves were closed, the canisters were dismantled and shipped to the laboratory for analysis.

