
Best Practice Guide

Microseparometer AOT Testing

If bad / inconsistent numbers are seen when performing the AOT test, there are several points which need to be followed which are critical to the test.

- 1) Good Reference fuel. A good reference fuel result (97+) must always be seen prior to any AOT test. Failure to achieve this may be the result of poor fuel / clay filter process / dirty storage vessel / dirty or faulty instrument.
- 2) ALWAYS perform 2 clean cycles per test.
- 3) ALWAYS use distilled water for the test.
- 4) The storage vessel must be a well maintained and clean item, ideally constructed of Teflon or coated with a substance which does not retain any surfactant and which is not used for storing different materials or different AOT concentrations. Ideally Teflon bottles are preferred and each bottle is only used for one process. Steel and glass vessels are preferred over epoxy lined containers as they are seen to degrade over time. If the vessel is used for different products / concentrations of AOT, then thorough cleaning before re-use is essential.
- 5) Use Nitrile based hand gloves instead of Latex based ones. Latex construction hand gloves have seen to have a big static influence which affects the emulsification process greatly, giving large errors in the final test result.
- 6) Use in a well-ventilated, temperature and humidity controlled environment. Very high humidity (above 80%) is known to cause issues with the test.

For continuous full range AOT testing, it is highly advisable to prepare the fuel and vessel for each value separately and never mix and change the vessels.

For a full test set (Reference, 0.2, 0.4, 0.6, 0.8), it is advised that 5 vessels, as described above, are used and each test is completed using fuel from the desired vessel. This therefore requires only 1 injection into the fuel ie 50µL distilled water. This removes any margin of error due to counting each of the 0.1 injections and inconsistencies of the method. It also improves repeatability of any test which is repeated at any of the levels. It is the method which the manufacturer – Emcee Electronics – advises and is used for all round robin testing.

The procedure of preparing the above vessels for the required dosage follows. Each example is into a **2 LITRE** vessel described above **SOLELY USED** for the particular range! Please also refer to the final x10 dilution referred to in ASTM D3948 section 7.5.1.2

Reference Fluid Base:	Fuel prepared to ASTM3948 7.4 which gives a result of 97+
0.2 Sample Fuel:	1996 mL of reference fluid base + 4mL of x10 Dilution
0.4 Sample Fuel:	1992 mL of reference fluid base + 8mL of x10 Dilution
0.6 Sample Fuel:	1988 mL of reference fluid base + 12mL of x10 Dilution
0.8 Sample Fuel:	1984 mL of reference fluid base + 16mL of x10 Dilution