ADERCO

*FUELING INNOVATION
FOR THE NEXT GENERATIONS*

CASE STUDY
MARINE

FUEL AGEING
BENCHMARK STUDY

BACKGROUND

Aderco was invited to participate in a fuel ageing benchmark study by V-TIC Services, a part of the Viswa Group. The benchmark study was designed to compare the effectiveness of the additives in limiting the degradation of fuel stability during a two-month storage period.

The test was designed to be anonymous, with the names of other additives kept confidential in the test result. The main criteria used for this test was Total Sedimentation Existent (TSE), which is the measure of sedimentation at that point in time. The amount of dry sludge retained on the filter paper correlates with the amount of sludge that is likely to be separated by an on-board centrifuge.

Other reported parameters were Density, Viscosity and Calculated Carbon Aromaticity Index (CCAI) of the fuel samples. A total of 10 samples with varied Density and Viscosity were used for the test. The samples were collected from major bunkering ports to reflect the varied nature of the low sulphur blended fuels.

SAMPLE	DENSITY, Kg/m³	VISCOSITY, eSt	CCAI	LOCATION
1	930.8	35.39	823	Bay Port, USA
2	936.5	37.10	828	Bay Port, USA
3	924.7	31.57	818	Barbours Cut, USA
4	926.1	48.87	813	Balboa, USA
5	954.1	132.3	827	Hong Kong, China
6	919.0	76.08	799	Singapore, Singapore
7	974.0	195.0	842	Beijing, China
8	964.3	285.1	828	Singapore, Singapore
9	976.5	624.3	833	Hamburg, Germany
10	942.2	133.3	815	Antwerp, Belgium

TEST RESULTS

The test results were separated between 4-weeks and 8-weeks results.

Initial TSP was measured for each fuel to benchmark the total sedimentation potential before dosing the samples with the additives. During the 4 weeks ageing, all samples showed signs of increased sedimentation, with a few samples demonstrating high sedimentation precipitation.

Sample	TSP	4 Week TSE	4 Week TSE-Additive A	4 Week TSE-Additive B	4 Week TSE-Aderco Additive
1	0.11	0.23	0.20	0.17	0.09
2	0.06	0.06	0.03	0.08	0.02
3	0.05	0.65	0.56	0.17	0.09
4	0.12	0.24	0.05	0.25	0.15
5	0.04	0.04	0.05	0.04	0.03
6	0.08	0.12	0.05	0.12	0.07
7	0.03	0.02	0.02	0.02	0.04
8	0.02	0.01	0.01	0.01	0.02
9	0.06	0.09	0.05	0.10	0.08
10	0.01	0.05	0.01	0.01	0.05

Sample	TSP	8 Week TSE	8 Week TSE-Additive A	8 Week TSE-Additive B	8 Week TSE-Aderco Additive
1	0.11	0.44	0.23	0.16	0.15
2	0.06	0.36	0.20	0.28	0.13
3	0.05	1.58	0.54	0.68	0.33
4	0.12	0.76	0.41	0.37	0.25
5	0.04	0.05	0.05	0.05	0.03
6	0.08	0.44	0.07	0.13	0.05
7	0.03	0.06	0.05	0.07	0.03
8	0.02	0.02	0.04	0.03	0.01
9	0.06	0.09	0.08	0.10	0.06
10	0.01	0.07	0.04	0.04	0.03

After 8-weeks, Aderco 2055G performed equal or better than the other additives in all fuel samples and showed very positive results in limiting the degradation of the fuel throughout the long storage period. The other two additives lowered the sedimentation, but the magnitude of their effectiveness was lower in comparison to Aderco. These results have been supported by the positive outcome of real cases with vessels in the last year and beyond

Aging at 50C for 4 weeks
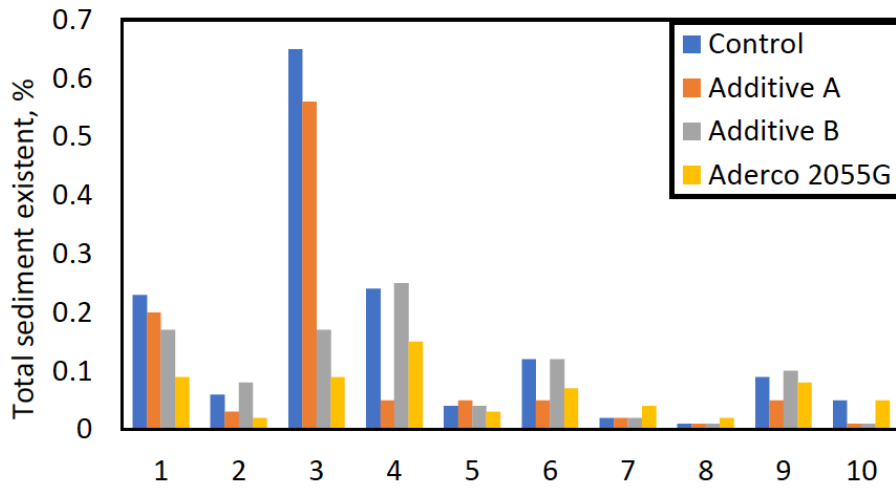
Aging at 50C for 8 weeks
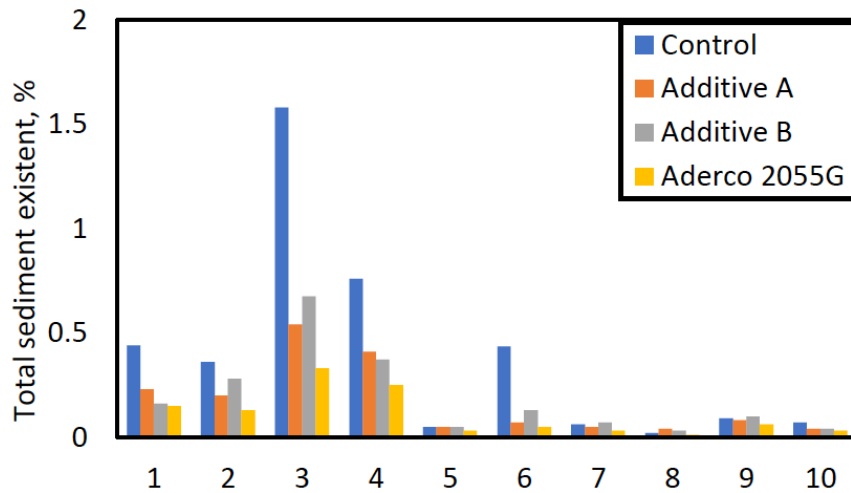
VISCOSITY

Viscosity has an important role in the stability of the fuel. Low viscosity fuels are usually blended with light distillates and these components evaporate during storage. This causes the fuel to destabilize. Higher viscosity fuels had little degradation of the fuel and the 8-week TSE was under the ISO 8217 specification limits.

In the benchmark study, the lower viscosity fuels have the highest 8-week TSE, with the lowest viscosity fuel (sample 3) having the highest TSE our of all other samples. This was consistent with the 4-weeks results, in which the low viscosity samples has higher TSE value when compared to the higher viscosity fuels.

Sample	Density	Viscosity	TSP	8 Weeks TSE	Additive A	Additive B	Aderco
1	930.8	35.39	0.11	0.44	0.23	0.16	0.15
2	936.5	37.1	0.06	0.36	0.2	0.28	0.13
3	924.7	31.57	0.05	1.58	0.54	0.68	0.33
4	926.1	48.87	0.12	0.76	0.41	0.37	0.25
5	954.1	132.3	0.04	0.05	0.05	0.05	0.03
6	919	76.08	0.08	0.44	0.07	0.13	0.05
7	974	195	0.03	0.06	0.05	0.07	0.03
8	964.3	285.1	0.02	0.02	0.04	0.03	0.01
9	976.5	624.3	0.06	0.09	0.08	0.1	0.06
10	942.2	133.3	0.01	0.07	0.04	0.04	0.03

The study demonstrates the ability of the additives in comparison to other similar products. The 8-week TSE results were the lowest in all fuel samples with the use of Aderco. In summary, the use of Aderco gives owners and managers the ability to keep fuel for long term storage and allows the use of fuel when needed without the worry of overloading the fuel system with sedimentation.

ADERCO
FUELING INNOVATION
FOR THE NEXT GENERATIONS