

# VLSFO FUEL GUIDE

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**HOW ADERCO 2055G IMPROVES  
THE FIVE KEY FUEL OIL ISSUES**



SLUDGE

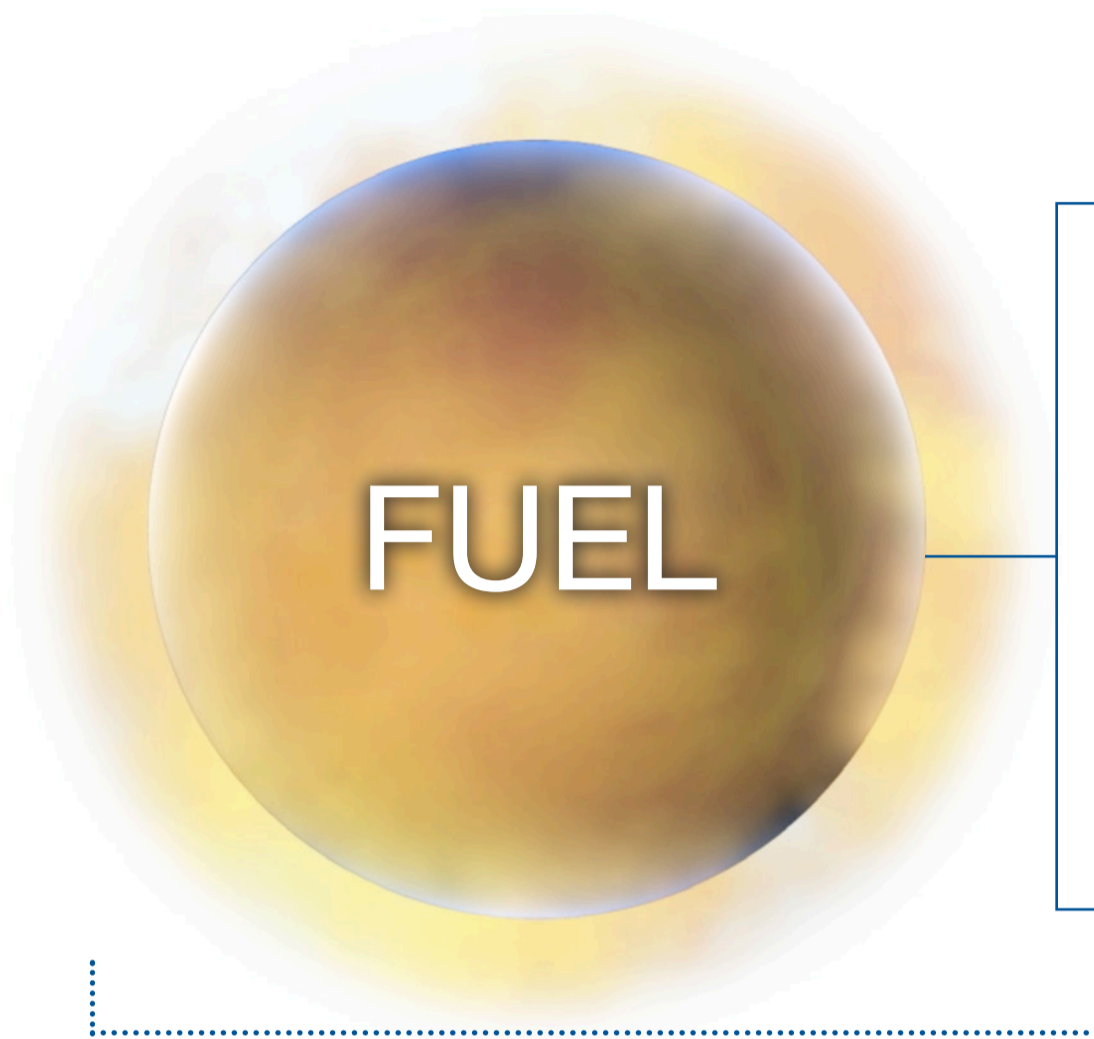
STABILITY

COMPATIBILITY

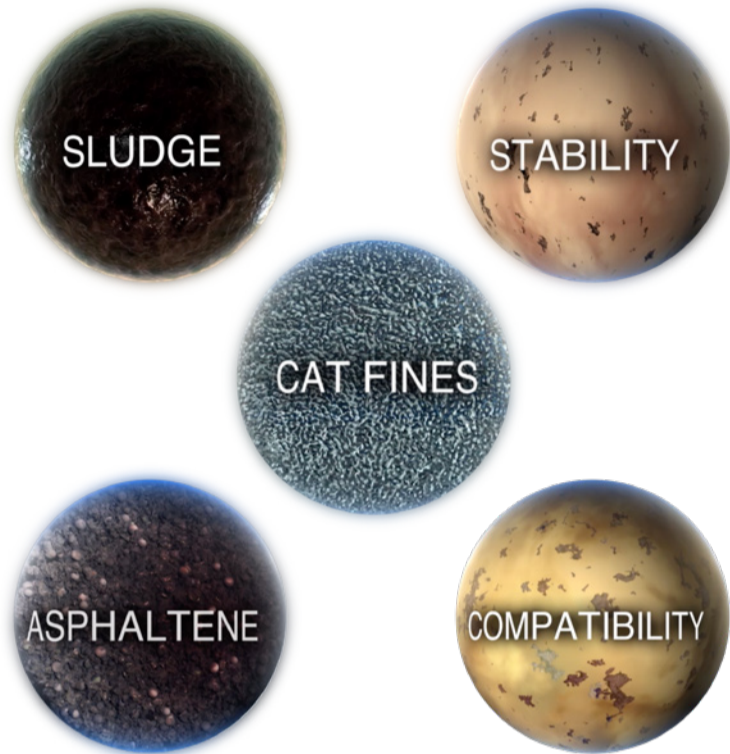
CAT FINES

ASPHALTENE

# Aderco VLSFO (Very Low Sulphur Fuel Oil) Fuel Guide



## THE FIVE KEY OIL ISSUES



## VLSFO FUEL CATEGORIES AND THEIR RELATED ISSUES

 <p><b>VLSFO Category 1</b> Drop Test 33.64cSt</p>	<p><b>CATEGORY 1</b></p> <p><b>Viscosity: From 5cSt to 60cSt</b></p> <p>Contains more paraffinic fractions</p> <ul style="list-style-type: none"> <li>• High stability issues</li> <li>• More paraffinic HC – more waxing - more sludge</li> <li>• High pour point – fuel handling issues</li> <li>• High sediment value – TSP</li> <li>• Chemical contaminants</li> <li>• Commingling risk with Category 2 and Category 3</li> </ul>
 <p><b>VLSFO Category 2</b> Drop Test 109cSt</p>	<p><b>CATEGORY 2</b></p> <p><b>Viscosity: From 61cSt to 120cSt</b></p> <p>A mix of paraffinic – light and heavy aromatic fractions</p> <ul style="list-style-type: none"> <li>• Moderate stability issues</li> <li>• Sediments value – TSP</li> <li>• Compatibility issues</li> <li>• Commingling risk with Category 1</li> <li>• Chemical contaminants</li> </ul>
 <p><b>VLSFO Category 3</b> Drop Test 278cSt</p>	<p><b>CATEGORY 3</b></p> <p><b>Viscosity: From 121cSt to 300cSt</b></p> <p>Mostly a mix of light and heavy aromatic fractions</p> <ul style="list-style-type: none"> <li>• Possible stability issues</li> <li>• TSP usually better</li> <li>• Paraffinic fractions can cause issues</li> <li>• Commingling risk with Category 1</li> </ul>

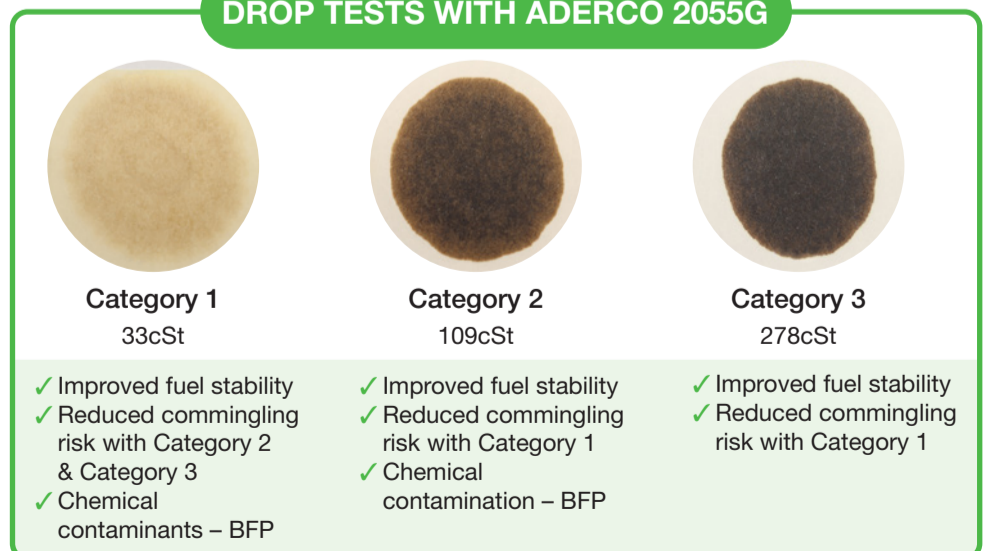
## VLSFO FUEL AND ADERCO 2055G

Our technical department has tested the efficiency of Aderco 2055G for each VLSFO Category. Test date 12 March 2020.

### DROP TESTS WITHOUT ADERCO



### DROP TESTS WITH ADERCO 2055G





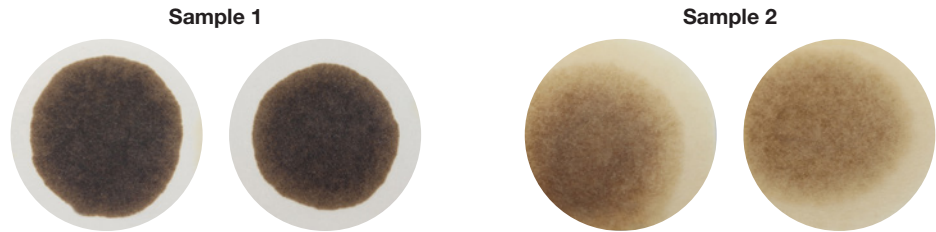
# COMPARATIVE FUEL TESTS WITH AND WITHOUT ADERCO 2055G



## 1. COMPATIBILITY TEST

After testing the efficiency of Aderco 2055G for each category of VLSFO, a Compatibility Blending Test (ASTM D4740) has been implemented.

Tests By: Aderco Marine  
Year: 2019-2020



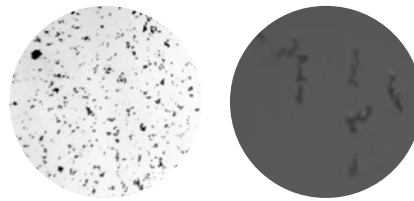
**Left: Mix VLSFO**  
Mix VLSFO categories at a ratio of 10% (Category 1) and 90% (Category 3)  
**2055G Drop Test Result**  
The heavy aromatic fraction of Category 3 is better dispersed. Upon close analysis, the clear paraffinic ring is thinner on the outskirts.

**Left: Mix VLSFO**  
Mix VLSFO categories at a ratio of 10% (Category 3) and 90% (Category 1)  
**Right: 2055G Drop Test Result**  
The Heavy aromatic fraction of Category 3 is much better dispersed with the Category 1 paraffinic fraction. Aderco 2055G helps to reduce fuel incompatibility within storage tanks, preventing sludging and easing filtration, purification and injection.

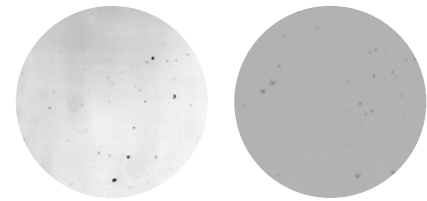
## 2. STABILITY TEST

Asphaltenes stability within the Aromatic 70% vs Aliphatic 30% components.

Containing: 2% asphaltenes  
Test By: CRIQ  
File: 640-PE2646  
Year: 2000-2018-2020



**Figure 1:** Non-evaporated solution containing 2% asphaltene and no ADERCO 2055G in benzene (magnification: 290X)

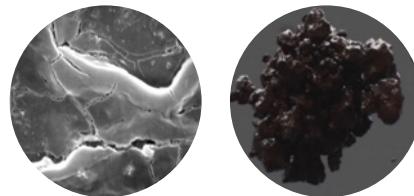


**Figure 2:** Non-evaporated solution containing 2% Shell asphaltene and ADERCO 2055G in benzene (magnification: 290X)

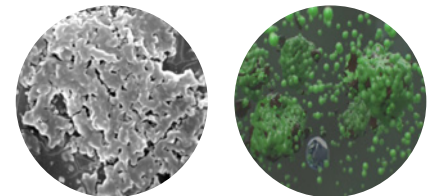
## 3. ASPHALTENES DISPERSION TEST

Within the Aromatic 70% vs Aliphatic 30% components.

Containing: 0,5% asphaltenes  
Test By: CRIQ  
File: 640-PE2646  
Year: 2000-2018-2020



**Figure 3:** Shell Asphaltene precipitated with heptane from a solution containing 0.5% Asphaltene and no ADERCO 2055G in benzene (magnification: 4140X)



**Figure 4:** Shell Asphaltene precipitated with heptane from a solution containing 0.5% Asphaltene and ADERCO 2055G in pyridine (magnification: 4140X)

## 4. SLUDGE TEST

VLSFO tanks deposit free.

Test by: Aderco Marine  
Year: 2019-2020  
File: 2020 ship tanks cleanliness follow-up



**Figures 5, 6 & 7:** No sludge deposits from VLSFO tanks after 4 months using Aderco 2055G

## 5. CAT FINES TEST

Settle down effect of Aderco.

T=0H fuel +92 ppm AL +116 ppm  
T=48H with Aderco = >80% of both are settled down.

Product: Aderco 2055G  
Test By: CRIQ  
File: PE48844  
Year: 2019



**Figure 8:** Test start: T= 0  
Left flask: fuel + cat fines  
Right flask: fuel + cat fines + Aderco 2055G\*



**Figure 9:** Test start: T= 24H  
Left flask: fuel + cat fines  
Right flask: fuel + cat fines + Aderco 2055G\*



**Figure 10:** Test start: T= 48H  
Left flask: fuel + cat fines  
Right flask: fuel + cat fines + Aderco 2055G\*

\*75% - 80% of the cat fines are rejected during the water draining at the settling tank.