

28<sup>th</sup> September 2022

**High Cloud Point Distillates in ARA**

The cold-flow characteristics of a fuel play an important role in the operability of a vessel. These properties become even more critical during winter months, when the ambient and sea water temperatures decrease significantly.

VPS has tested several distillate fuels bunkered in the Port of Rotterdam, during the months of August and September 2022, where their Cloud Point reached temperatures as high as 21°C and their Pour Point temperatures were as high as 12°C.

It is worth noting that between the month of September to the end of March, the ambient temperature (and sea water temperature) within the ARA region and surrounding areas fall well below these recently recorded pour point and cloud point levels.

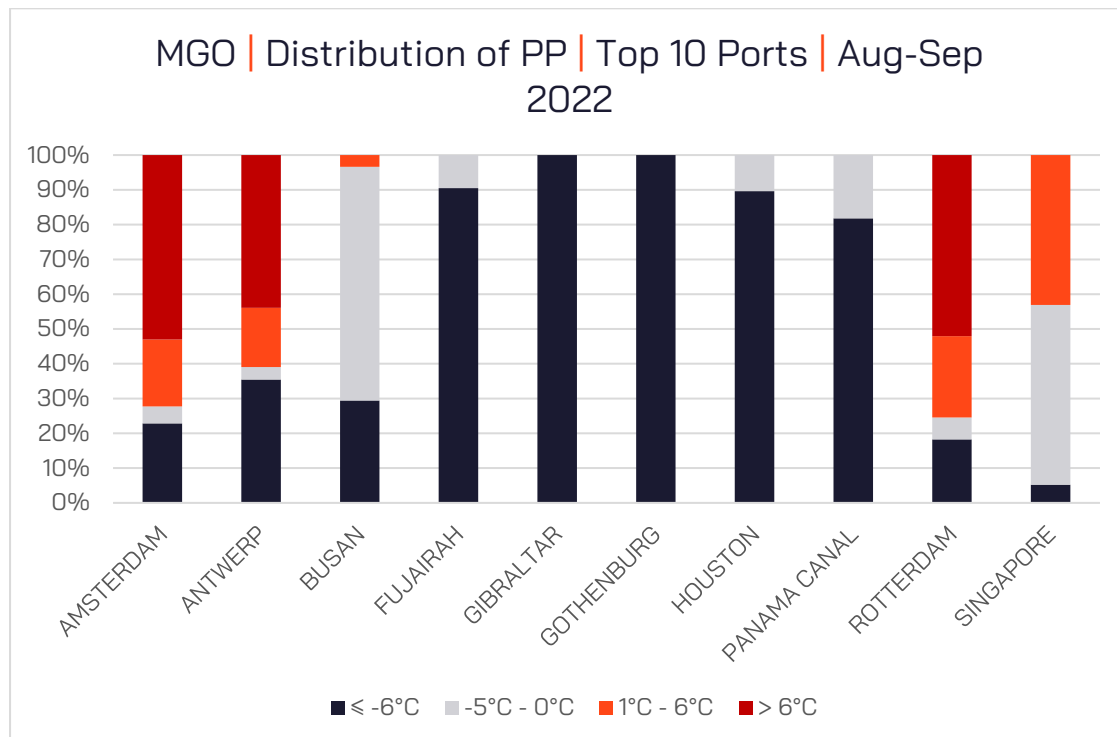


Figure 1: Distribution of pour point in DMA grade distillates top 10 ports, Aug-Sep 2022

**Pour Point-** The reported pour point is the lowest temperature at which the fuel will continue to flow when it is cooled (ISO 3016). From the above Figure 1, we can see the current high Pour Point distribution in the ARA region.

# Circular

Under such circumstances, distillate fuels can experience issues with low temperature operability mainly by forming deposition of solid wax in fuel tanks, fuel lines, centrifuges and filters.

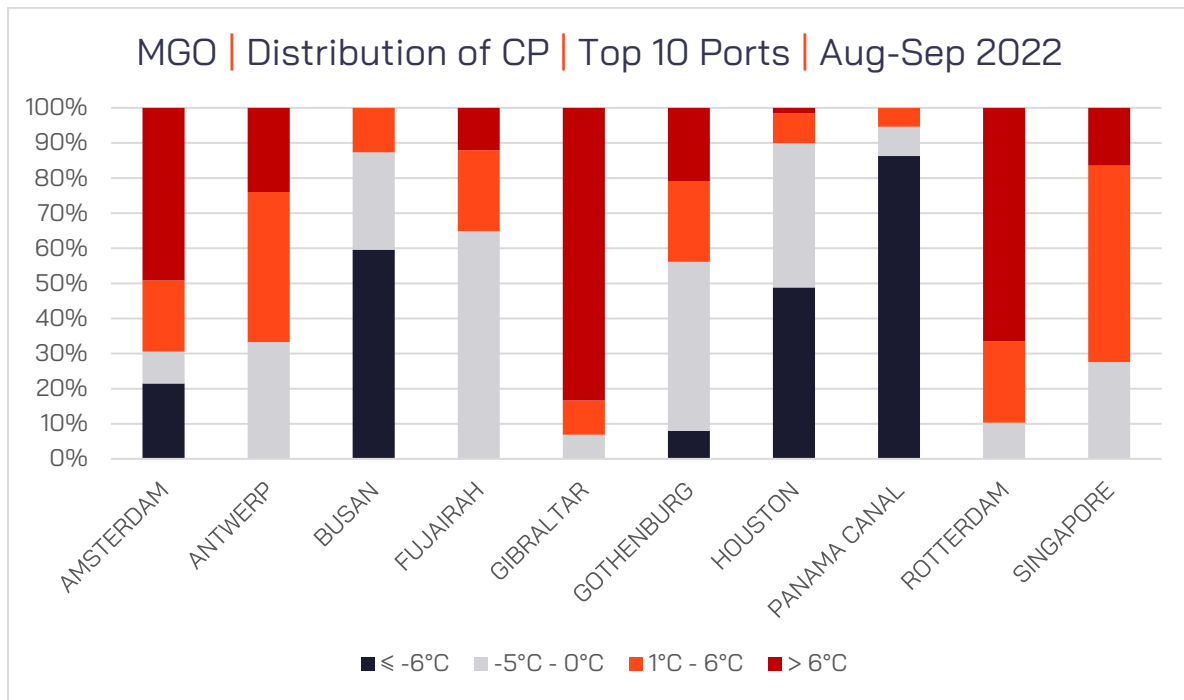


Figure 2: Distribution of cloud point in DMA grade distillates top 10 ports, Aug-Sep 2022

**Cloud point (CP)**-The cloud point is defined as the temperature at which wax crystals starts to visibly form in the fuel and a transparent fuel becomes cloudy (ISO 3015).

From the above Figure 2, we can see that cloud point of the fuel in the ARA region is high and consistent with the high pour point within the region as seen in Figure 1.

However, in addition to the ARA region (which has high PP and CP), we can also see high Cloud Point (CP) in Gibraltar, Gothenburg and few other ports which have low PP.

This proves statistically it is not possible to determine the CP (and Cold Filter Plugging Point (CFPP)-see Figure 3) just from knowing the PP, as the correlation between these properties is poor.

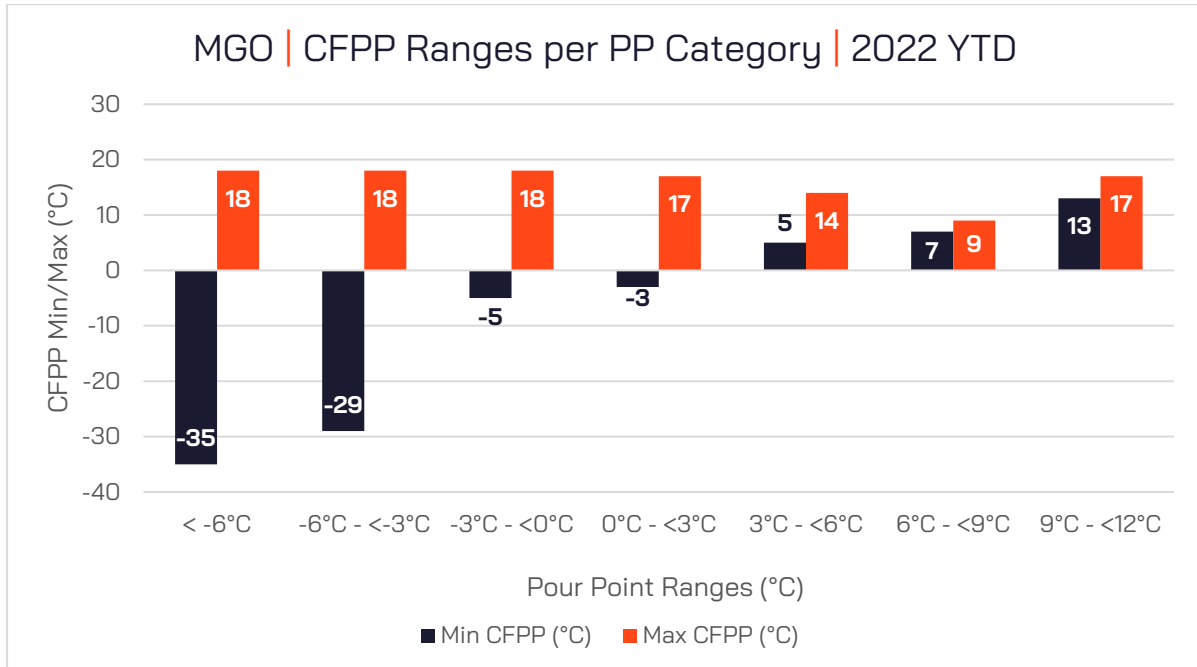


Figure 3: Max / Min CFPP range for DMA grade distillates against Pour Point - Global coverage 2022

*Cold Filter Plugging Point (CFPP)*-is the lowest temperature where the fuel of a set volume, drawn, by vacuum, through a standardised filter (45 micron) within a specified time (60 sec) still continues to flow (ASTM D6371).

Figure 3 shows, as an example, fuels with a PP of <-6°C which can exhibit a CFPP of 18°C. This would mean that fuels which fully comply with the PP specifications may still experience heavy wax deposits within a vessel’s separators, potentially restricted filters, along with heavy wax deposits within it’s storage tanks.

The pour point requirement as defined in Table 1 of the ISO 8217:2017, cannot guarantee operability for all ships in all climates. Therefore, for winter grades of DMA, DFA, DMZ and DFZ, the cloud point and cold filter plugging point shall be reported (as per ISO 8217).

The fuel purchaser should confirm that the cold flow characteristics (pour point, cloud point and cold filter plug point) are suitable for the ship’s design and intended voyage.

The fuel purchaser should also consider for discussion with the supplier, the cold flow property requirements before procuring the fuel such as:

- Tank heating capacities, considering many vessels may not have a heating arrangement for their distillate tanks.
- Any heating restrictions due to the cargo-type being carried on board.
- The Vessel’s trading voyage, which will affect the seawater and ambient air temperatures encountered.
- The effect of viscosity drop when heating the fuel in order to maintain it above the pour point.
- The effect on the shelf life of the fuel whilst keeping it at elevated temperatures during storage.



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The fuel temperature should be kept approximately 10°C above the pour point, in order to avoid any risk of solidification. However, this may not reduce the risk of filter blocking in case of high CFPP and CP.

For this reason, it is critical for the vessel's crew to be aware of all the specific cold-flow properties of the fuel which has been bunkered. Therefore, ensure PP, CFPP and CP testing is undertaken, in order to assess the fuel's suitability for the intended voyage.

To find out more on how VPS can help you with your marine fuel management, please contact [technical@vpsveritas.com](mailto:technical@vpsveritas.com) or contact your Local VPS Office & Account Manager.

More contact details can be found at [www.vpsveritas.com](http://www.vpsveritas.com).

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