September 2025

Bunker Quality Trends

Geopolitical and legislative challenges impacting marine fuels.



Integr8
Fuels

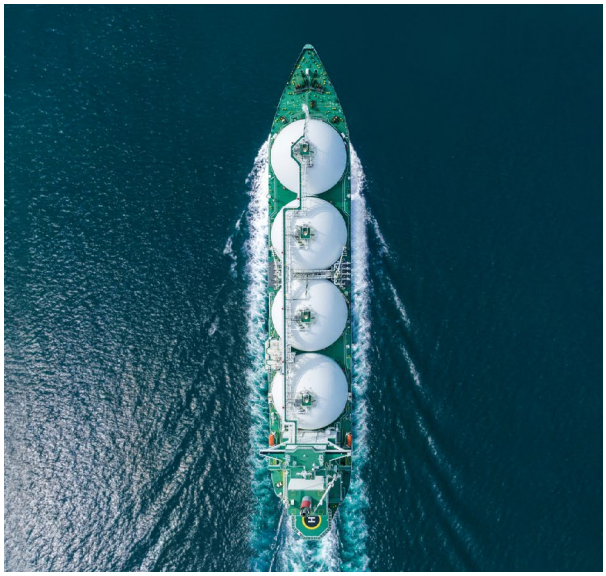
Introduction

Written by: Chris Turner, Manager of Bunker Quality & Claims

Geopolitical and legislative challenges impacting marine fuels

The ever-shifting sands of geopolitics and legislation are, more than ever, shaping the challenges the bunker industry faces.

Sudden changes in sanctions can derail tried and tested supply chains in an instant. Legislation may be planned, yet enforcement dates create practical challenges for a historically reactive industry, and while nothing is insurmountable, the need to move, adapt, and reassess is greater than ever. This report addresses a turbulent first half of 2025 and the consequences visible in fuel quality and supply trends.



Data Used in This Report

JANUARY – JUNE 2025

+62m	1,114	+750
MTs of Deliveries	Global Locations	Suppliers

Global Quality Trends

Written by: Chris Turner, Manager of Bunker Quality & Claims

Which fuel grades are most likely to trigger a quality notification?

In the six-months from January to June 2025 (H1 2025), owner versus supplier testing shows Ultra Low Sulphur Fuel Oil (ULSFO) as the grade most likely to trigger a quality notification beyond the 95% confidence limit at 3.5% of samples.

Heavy Sulphur Fuel Oil (HSFO) is the second most frequent at 2.6%, followed by Low Sulphur Marine Gas Oil (LSMGO) at 2.4% and Very Low Sulphur Fuel Oil (VLSFO) at 2.1%.

In general terms, this echoes earlier observations: residual products continue to display greater variability, yet the still-limited ULSFO pool now heads the table on a proportional basis and given the sharp rise in ULSFO test volumes, prompts a new chapter to track the grade's evolving quality landscape and outline emerging operational risks, with particular focus on the new Mediterranean Emission Control Area.

Fuel Grade	Beyond 95% Confidence* %	Compliance %	Critical %	High Risk %	Low Risk %
HSFO	2.6 (-0.3)	0.1 (=)	0.9 (+0.5)	1.0 (+0.5)	1.6 (-0.4)
VLSFO	2.1 (-0.3)	0.7 (-0.1)	0.8 (+0.2)	1.5 (+0.1)	0.6 (-0.1)
ULSFO	3.5	1.6	0.4	2.0	1.5
LSMGO**	2.4 (-0.9)	1.3 (-0.2)	0.2 (=)	1.5 (-0.2)	0.9 (+0.2)

Figure 1: Types and frequencies of notification by grade excluding biofuel blends (% change since last report in brackets, ULSFO data assessed for the first time).

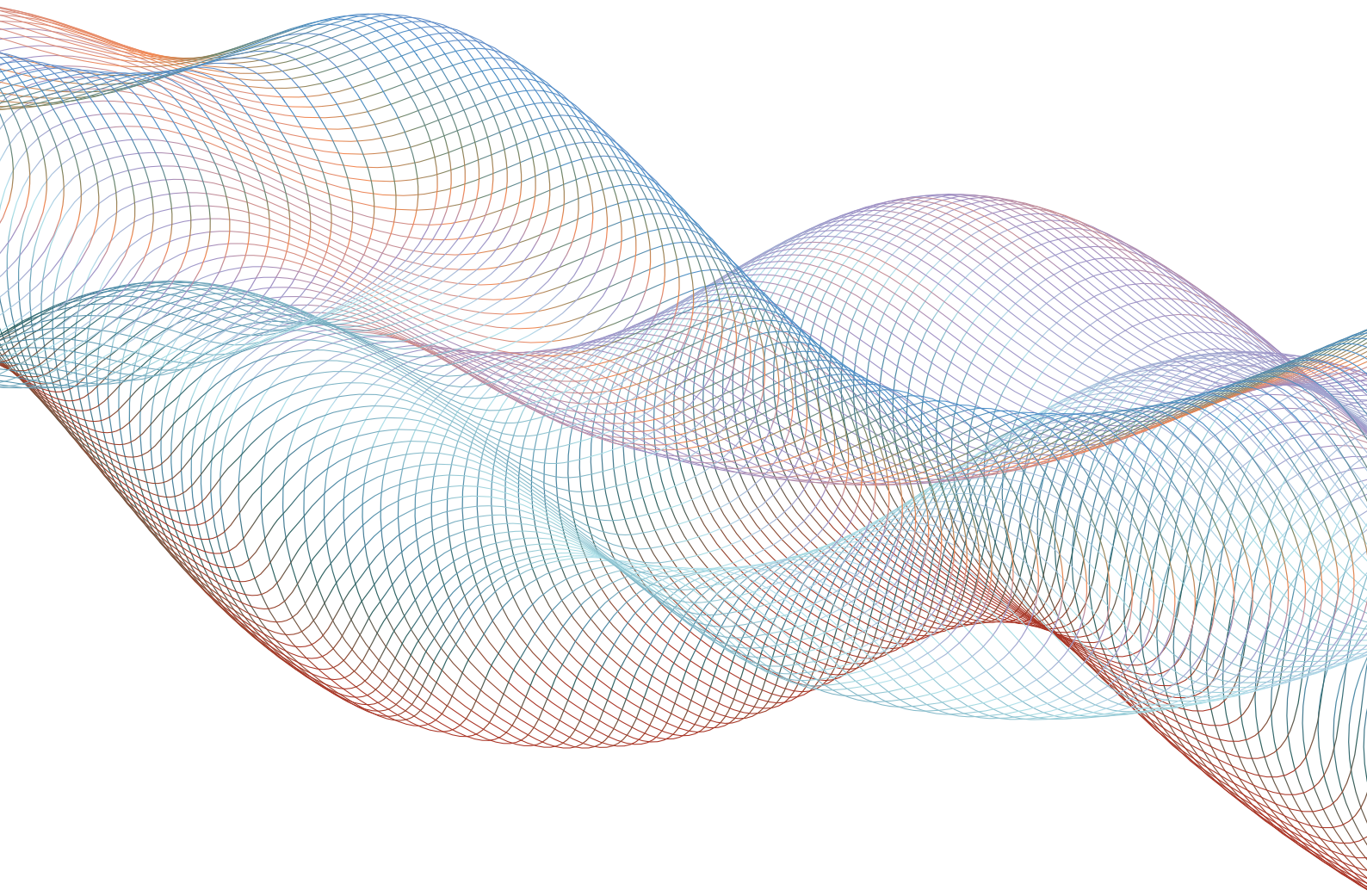
**Beyond 95% confidence for a parameter listed in table 1 or table 2 of ISO 8217:2010 basis owner test.*
***Data includes pour point notifications in Singapore (which is not routinely guaranteed) and fuels that may contain biofuels but are not identified as such.*

How likely are we to face a major quality issue within ISO 8217 table parameters?

In practical terms, the likelihood of encountering a fuel that breaches an ISO 8217 table limit is low.

Bunker quality is often blamed when a vessel develops mechanical trouble, yet independent studies show that genuine fuel faults are comparatively uncommon. The most recent engine damage reviews point instead to lubrication oil failure as the leading cause of main engine claims, with poor housekeeping and post-delivery handling frequently cited as contributing factors.

Integr8 Fuels' own data reflect the same pattern: critical parameters such as cat fines, total sediment and used lubricating oil are seldom found above specification limits in owner tests. Even so, systematic analysis of fuel quality data remains an essential part of any buying strategy that seeks to protect efficiency and profit, while safeguarding safety and the environment.



High Sulphur Fuel Oil

Written by: Chris Turner, Manager of Bunker Quality & Claims

HSFO Availabilty

High Sulphur Fuel Oil's global availability is overwhelmingly anchored by a handful of core hubs.

Over December 2024 – May 2025, Singapore supplied roughly 35–38% of all HSFO each month, while China's coastal ports contributed 5–8%. The Amsterdam–Rotterdam–Antwerp (ARA) complex accounted for 8-10% of monthly volumes, underscoring its critical blending and scrubber-fitted fleet support role.

Whilst demand signals point to HSFO supply settling into a more stable state with new exhaust gas cleaning system (EGCS) orders slowing and most retrofit work now complete, geopolitical undercurrents still trouble the high sulphur supply chain.

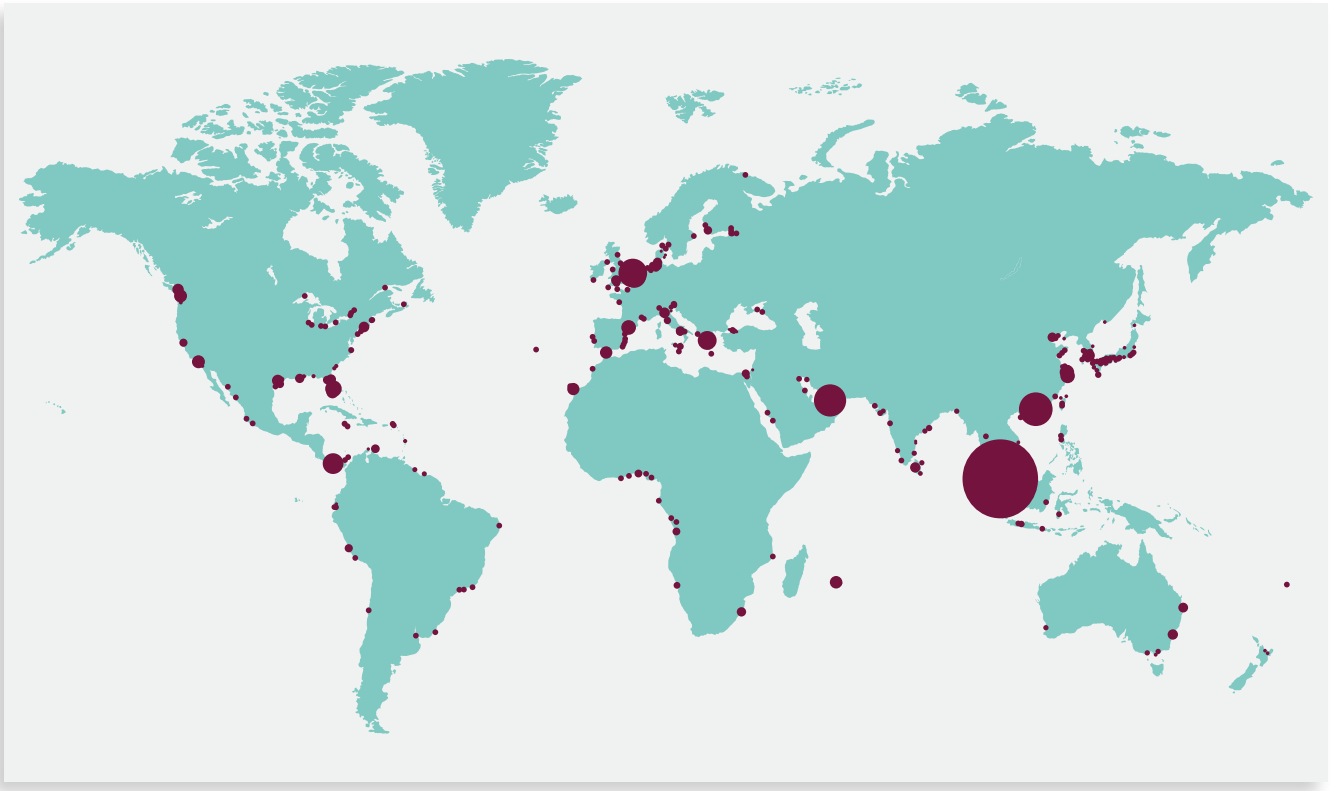


Figure 2: Global availability of HSFO H1 2025.

Anecdotal feedback and our own experiences point to a sharply reduced prompt pool of HSFO in the ARA hub. Independent tank-stock reports suggest HSFO inventories are at multi-month lows. In recent weeks it has become apparent that it is necessary to nominate nine to ten days ahead for an HSFO stem whilst VLSFO parcels were available more promptly – in about five to six days from intended supply.

The tightness is widely linked to fewer Russian residue cargoes moving into Europe after the latest sanctions package. With fewer heavy barrels feeding local blend tanks, some suppliers have asked scrubber-equipped vessels to consider lifting very low sulphur instead, or to accept longer loading windows for high sulphur – which may not be operationally feasible and incur extra costs such as layby berths.

Buyers might assume that shifting to VLSFO at short notice makes commercial sense, but such a move can raise real technical headaches on board. If a large stem of ≤ 0.50% sulphur fuel is to be burned for any extended period, the vessel's cylinder-oil package must first be adjusted to match the much lower sulphur content. More troublesome still is the basic difference in fuel chemistry between HSFO and VLSFO: if the two grades cannot be segregated in storage, settling or day tanks, they can become incompatible, with sediment drop out leading to sludge formation, clogging of purifiers and filter choking throughout the fuel system.



HSFO Traded ISO Specifications

In the first half of 2025, a little more than half of Integr8 HSFO trades were placed on ISO 8217:2010, while the 2017 edition jumped markedly to just over 49%.

No neat HSFO deals were sold to ISO 8217:2024. Figure 3 illustrates the split in HSFO traded volumes by specification. The lack of HSFO trades to 2024 specification is surprising because the new table makes only modest adjustments for high sulphur grades: minimum viscosity is not a concern and the Maritime and Port Authority in Singapore already enforces the broader sediment checks set out in the revision and their own enhanced testing protocols.

The real hurdle sits upstream. To badge a parcel as 2024 compliant, the ex-wharf supplier must issue a Certificate of Quality that lists existent, accelerated and potential sediment, confirms organic halogens below fifty milligrams per kilogram by EN 14077, and a clean polymer screening result. Major oil companies and large blenders can provide this data, but independent suppliers would have to fund the extra tests and accept the risk of an off specification finding.

Compounding the issue, many charter parties are still drafted around the 2010 or 2017 text and simply do not ask for 2024 compliance, so there is little commercial pressure on smaller suppliers to make the switch. Until the larger producers push the new certificate format, and buyers insist on it in their contracts, the market is likely to remain anchored to the older specifications despite the clear regulatory tailwind behind ISO 8217:2024.

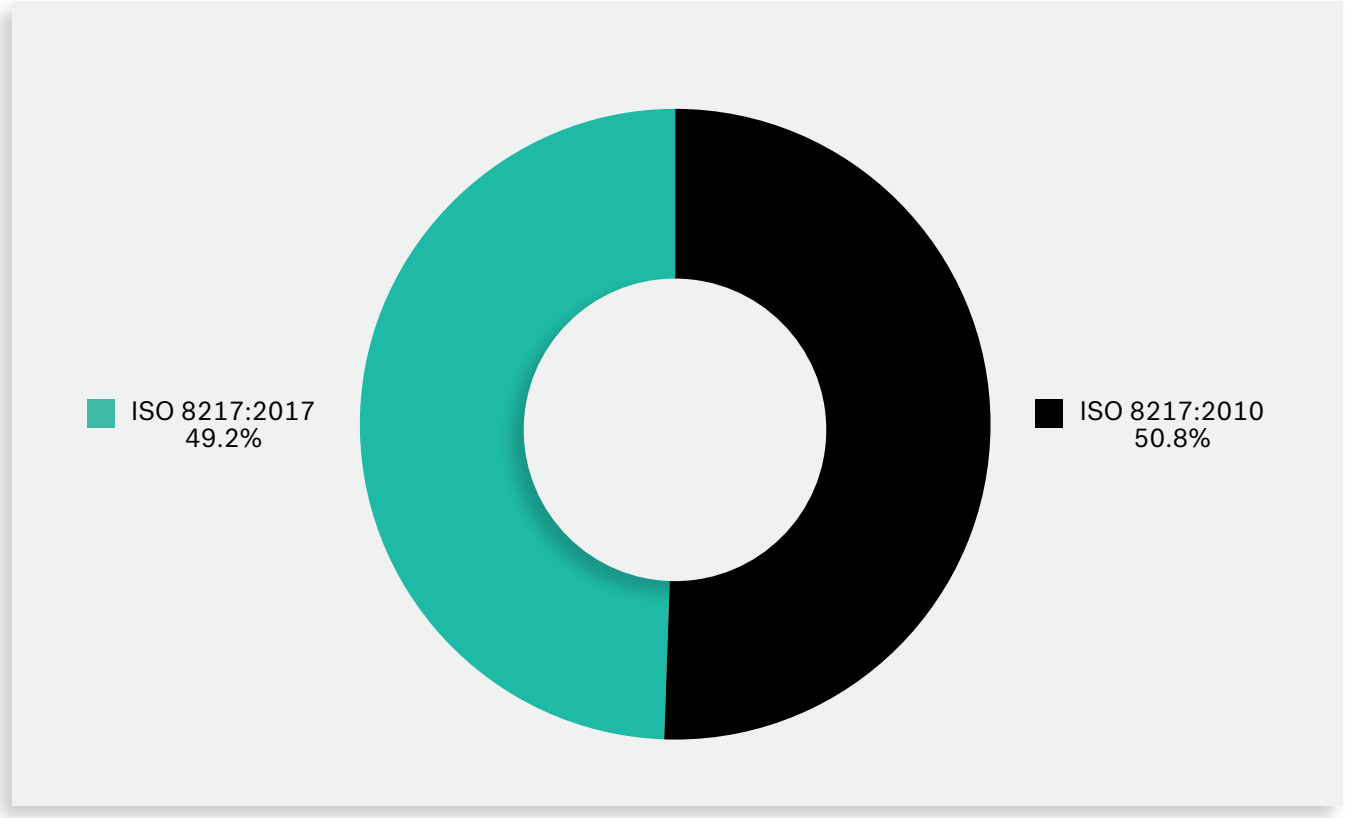


Figure 3: HSFO traded volumes by specification H1 2025.

HSFO Quality

Over H1 2025, only 2.6% of HSFO supplies tested beyond 95% confidence – an improvement on the previous period's 2.9%.

Critical infractions (aluminium and silicon, total sediment potential) remain negligible, and sulphur/flash-point non-compliances continue at very low levels. 65% of all off specification parameters can be associated with blending and/or housekeeping, i.e. viscosity, density and water content. This is reduced from almost 80% previously, largely due to fewer viscosity infractions because of a decreasing trend in viscosity.

Regionally in Singapore, a slippage in HSFO quality appears to be occurring with the overall notification rate more than doubling in the past six months, driven chiefly by a surge in elevated ash content reports – and a parallel rise in sodium alerts. Together these two parameters now represent roughly 44% of all notifications (double the global figure), overtaking water as the dominant concern.

Blending infractions in viscosity and density are no longer the principal driver of Singapore HSFO quality notifications. They warrant routine monitoring, but focus should now pivot to controlling inorganic contaminants, particularly ash-forming material and sodium ingress.

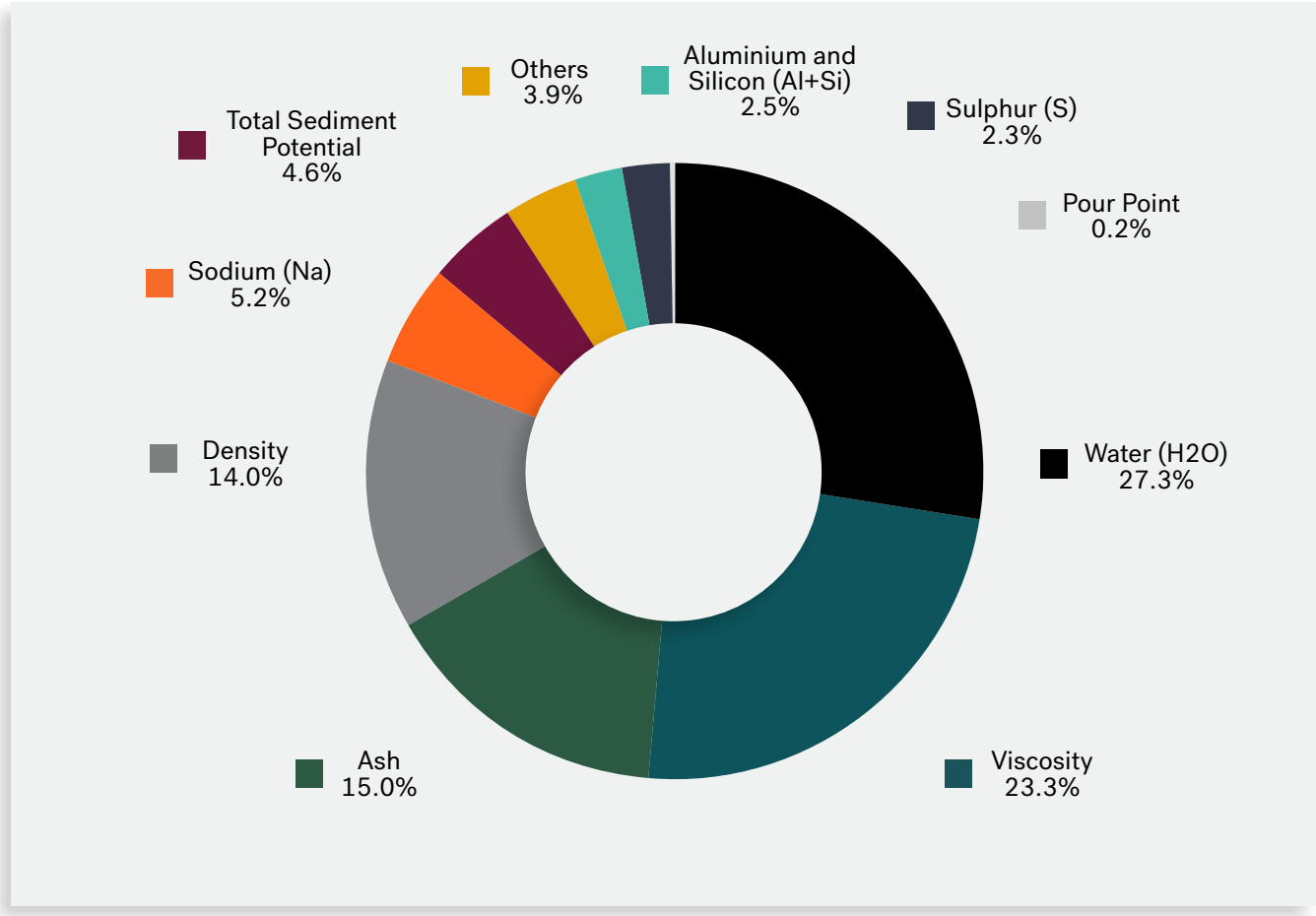


Figure 4: Distribution of quality infractions by parameter HSFO H1 2025.

These significant changes correlate with a structural shift in barrels available for HSFO blending in Singapore, with metal-rich Middle Eastern cargoes replacing flows curtailed by tighter U.S. sanctions introduced in January 2025. For that reason, this altered fuel quality profile is expected to persist.

Across the ARA hub the quality picture is moving in lockstep with Singapore. Off spec notifications now hover around 4% of all HSFO tests, almost double the 2.3% registered late last year.

Ash is the leading trigger, responsible for more than a quarter of recent alerts, trailed by water and a noticeable rise in high-density findings, while viscosity failures have slipped into low single digits. The timing dovetails with the sharp loss of Russian residue after the January 2025 sanctions package and the influx of apparent heavier, metal laden cargoes. Unless that supply mix changes, ash and related metal markers are set to remain the dominant quality risk in ARA, with traditional blending infractions taking a back seat.

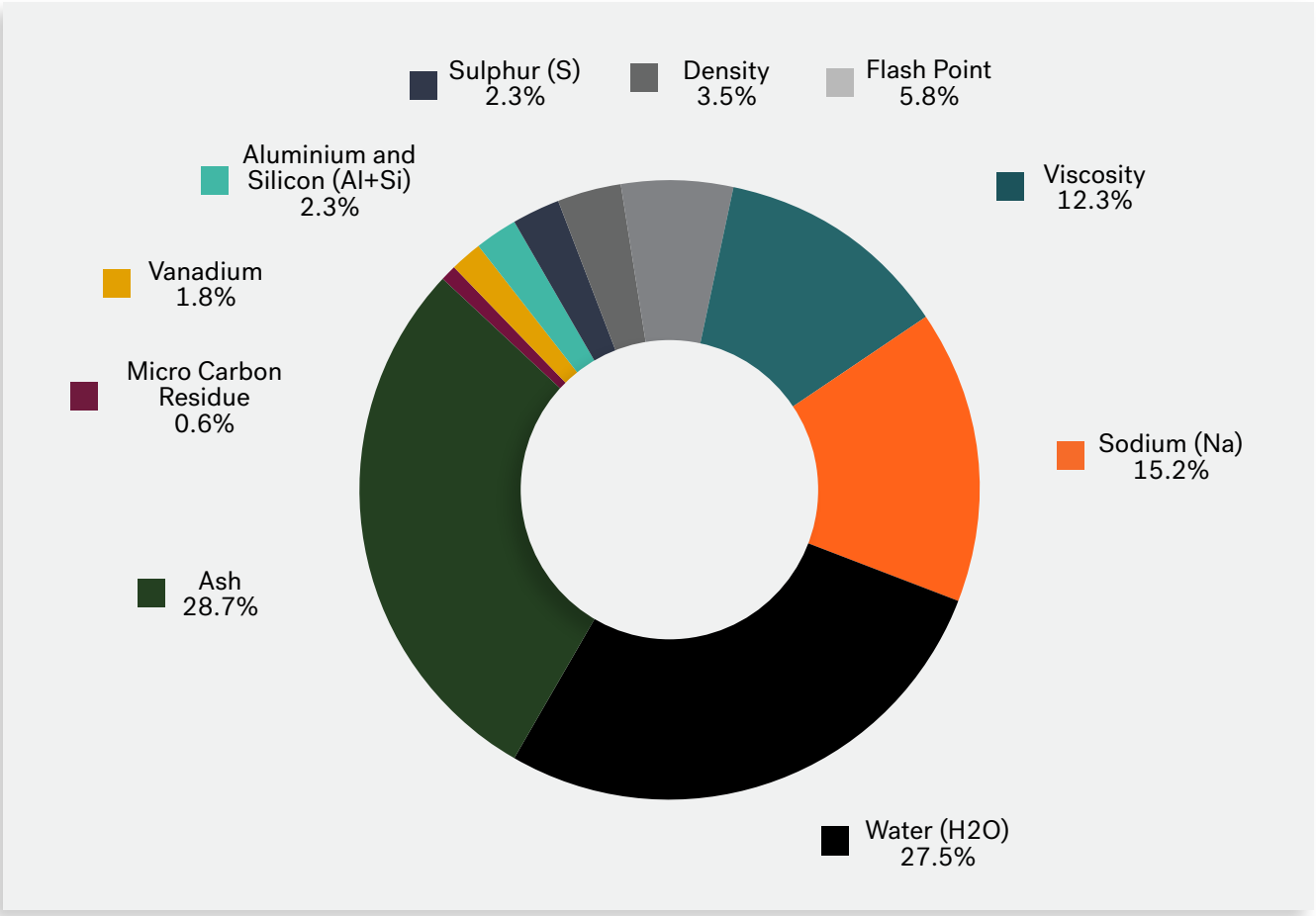


Figure 5: Singapore HSFO quality notifications by parameter H1 2025.

Very Low Sulphur Fuel Oil

Written by: Chris Turner, Manager of Bunker Quality & Claims

VLSFO Availabilty

The January–June 2025 dataset show VLSFO can now be lifted in roughly 680 ports worldwide, up by just over 6% from the 640 or so noted previously.

HSFO has edged higher too, to about 385 ports, but VLSFO still remains almost double in terms of geographic reach.

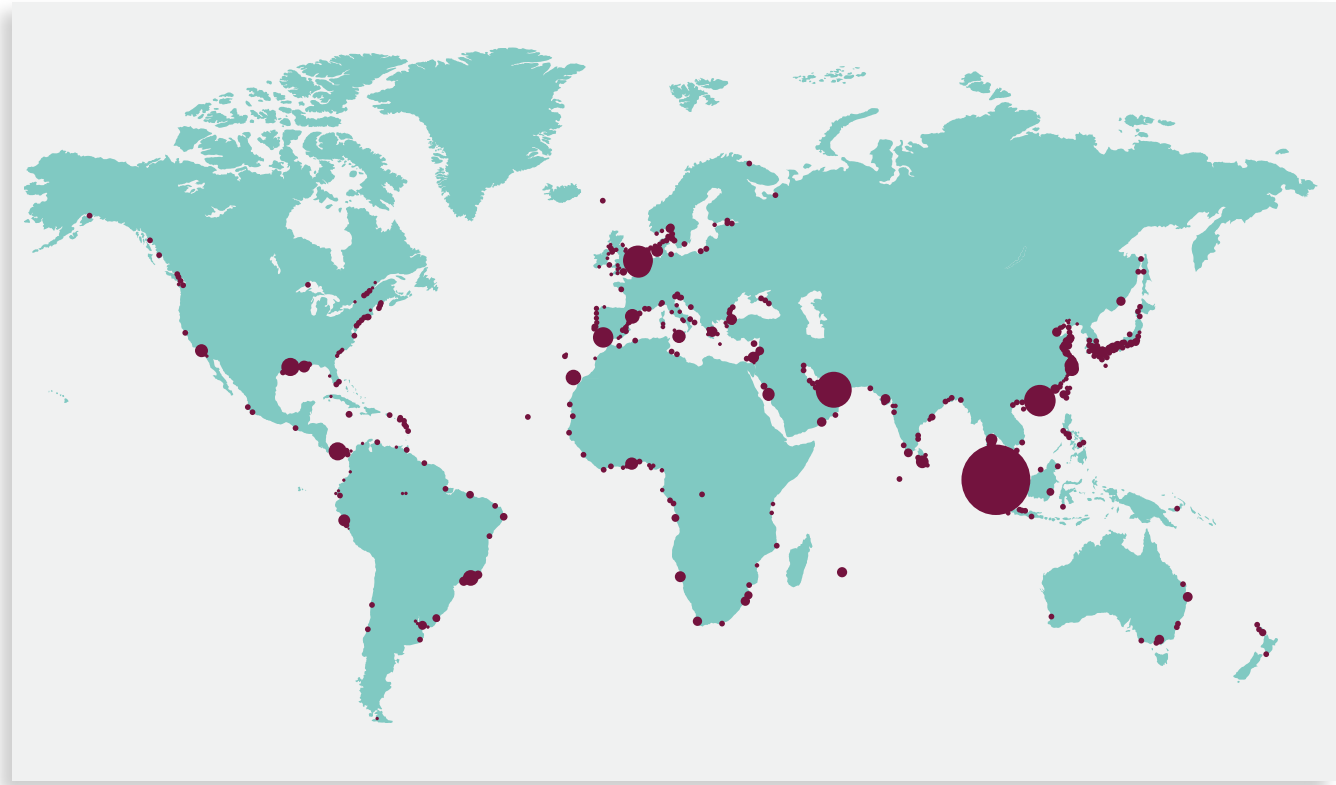


Figure 6: VLSFO availability H1 2025.

VLSFO Traded ISO Specifications

During H1 2025 the share of VLSFO parcels sold to ISO 8217:2017 specification has climbed to 47.2% (up from 39.3%), almost matching the 2010 edition, which has eased back to 51.7% from 59.0%.

The older 2005 and 2012 tables together account for barely 1% of trades, and we have yet to record any stem guaranteed to the new 2024 specification despite its May 2024 release.

In short, buyers are steadily migrating toward the 2017 table, but the 2010 version still commands the majority of deals, reflecting a preference for contractual familiarity while the industry digests the broader testing slate introduced in ISO 8217:2024 (see figure 7).

The headwinds to ISO 8217:2024 remain as previously described with the only real offers being received from suppliers for some biofuel blends i.e. B30 VLSFO.

Average VLSFO viscosity has trended steadily higher since last autumn. After hitting a floor near 147 cSt in October 2024, monthly means climbed into the mid-150s by January 2025, reached roughly 178 cSt in June, and eased back to around 172 cSt in July. The rise reflects a gradual return of heavier blend-stocks and a lighter touch on distillate cutters, nudging the pool back toward the pre-2020 norm.

That shift has cut the share of low viscosity products dramatically. Six months ago, 46% of tested cargoes sat below the ISO 8217:2024 minimum of 120 cSt; by the end of H1 2025 the proportion had fallen to 32%. In practical terms two-thirds of the market now meet the minimum limit, easing supplier concerns and making 2024 spec tenders far less risky for buyers.

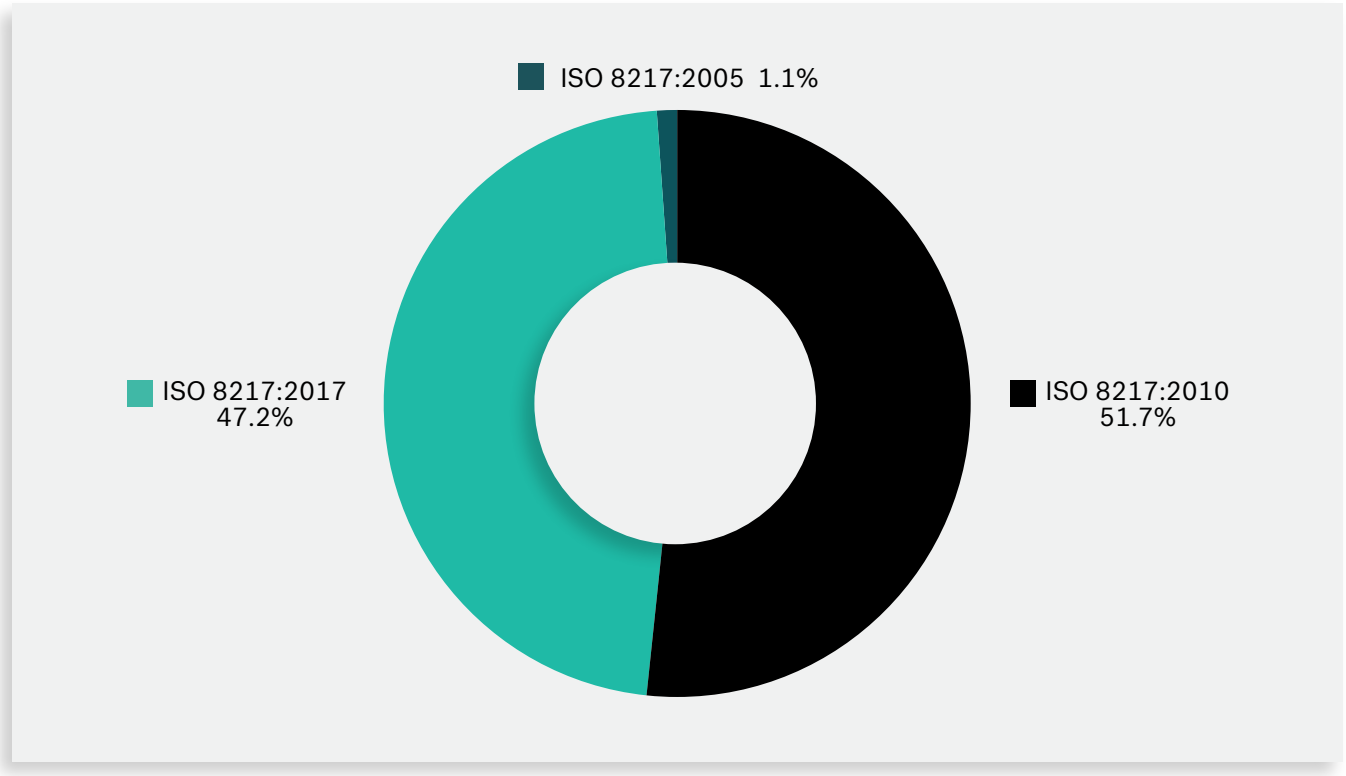


Figure 7: VLSFO traded volumes by specification.

VLSFO Quality

2.1% of all VLSFO supplies were reported as testing beyond 95% confidence limits for ISO 8217 table 2 parameters in the last 180 days – the same as previous.

The data identifies that the risk of a fuel exhibiting MARPOL non-compliance for VLSFO is significantly higher globally than for HSFO at 0.7%. However, this again does not tell the full story given the elevated risk of non-compliance noted in certain locations.

Based on the latest cross section of potential infractions, hit-rates for high-risk parameters such as cat fines (aluminium and silicon) and total sediment potential (TSP) remain very low in absolute terms – still running at only about two supplies in every thousand deliveries. Their proportional share inside the off spec basket has, however, edged up from 7% and 9.7% in H2 2024 to around 11% each in H1 2025, largely because sodium and density breaches have fallen away.

The overall mix of VLSFO quality issues remains broadly unchanged: sulphur, water, TSP and cat fines together now make up just over 73% of all recorded infractions, in line with the two-thirds dominance noted in the previous report. Flash point non-compliances are almost non-existent at well below one sample in a thousand, underscoring that the main legislative pinch-points for VLSFO continue to sit under MARPOL rather than SOLAS.

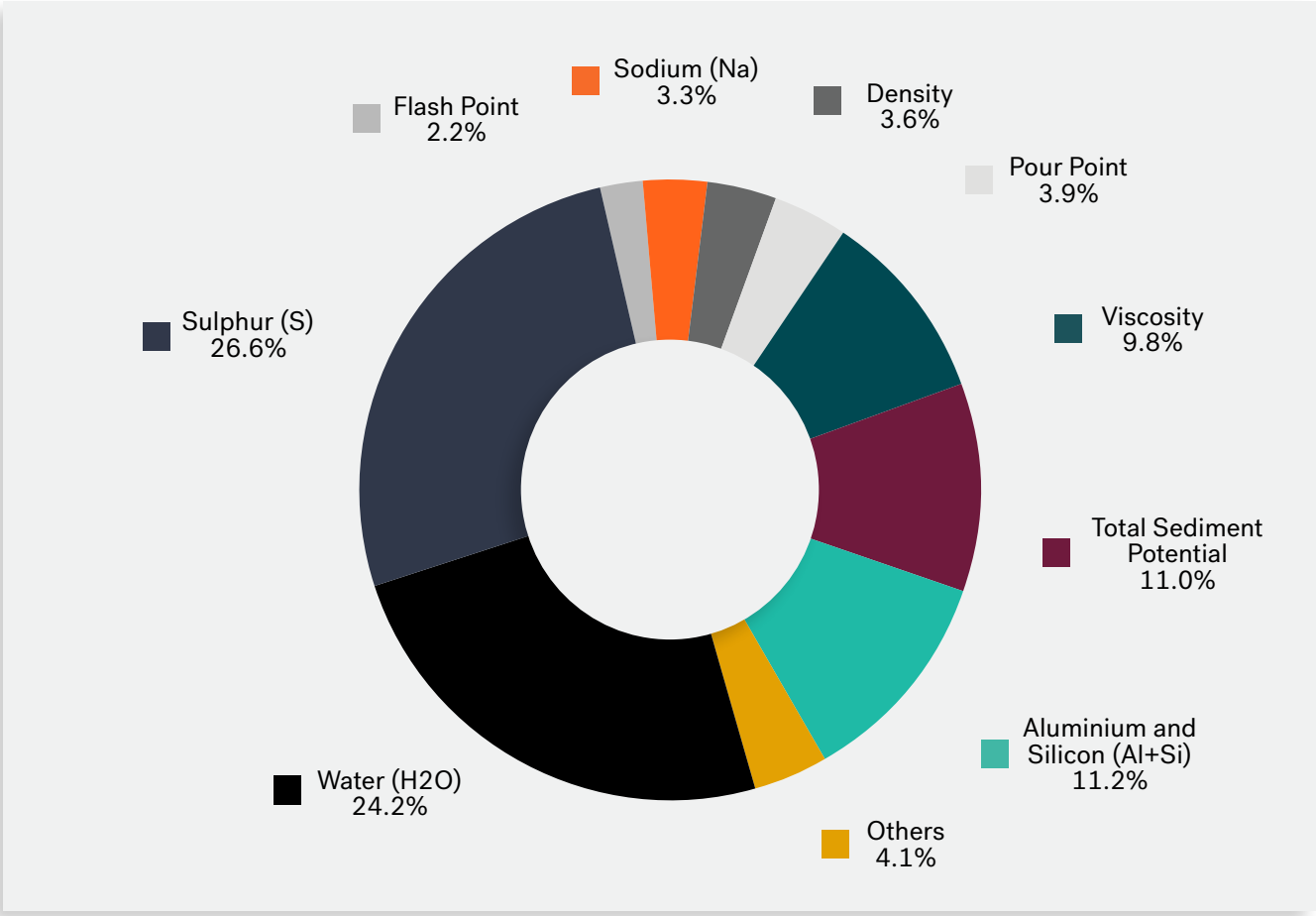


Figure 8: VLSFO parameters of fuels testing beyond 95% confidence.

Previous reports highlighted the ARA complex as the principal sulphur risk for VLSFO, and the latest half-year data confirm that assessment. Across the twelve ports that provide data for the hub 9.5% of all VLSFO samples test in the grey zone between 0.51 and 0.53% Wt., inside the 95% statistical tolerance band, and **1.7%** test beyond that.

By contrast Singapore maintains an exceptional record: **1.4%** borderline and only **0.2%** off spec. In practical terms, a stem lifted in ARA today carries roughly an **eight-fold higher** probability of analysing beyond the MARPOL sulphur cap than one loaded in Singapore based purely on owners' analysis.

Country	Tolerance Sulphur 0.51-0.53 Incl.%	Sulphur exceeding 0.53%
Singapore	1.4 (-2.0)	0.2 (-0.3)
Belgium & Netherlands (ARA)	9.5 (+0.4)	1.7 (-0.2)
Rest of the World	1.7 (=)	0.7 (-0.2)

Figure 9: Distribution of owner sulphur results for VLSFO by area.

Interestingly the risk distribution inside ARA remains uneven. Core bunkering points such as Rotterdam and Antwerp show manageable off spec rates of 1-2% yet still record almost one sample in ten sitting in the tolerance band. Peripheral ports display materially weaker performance, with outright failure rates running into double digits in some cases.

This suggests other factors at work rather than simply the ex-wharf blending practices, such as sample cross contamination due to barges carrying both VLSFO and HSFO which remain prevalent with some supplier models.

Singapore's sulphur profile shows no sign of systemic deterioration. The marginal rise in borderline cases observed in aggregate quality reporting is not driven by sulphur but by water and ash, leaving MARPOL exposure effectively unchanged. Routine compliance checks remain more than adequate for fixtures in the port.

Outside Singapore and the ARA hub, barring local deviation, sulphur performance is broadly stable: only 1.7% of owner samples fall into the borderline range and a modest 0.7% exceed 0.53%, confirming that most other bunkering regions continue to supply VLSFO that is comfortably MARPOL compliant.

Taking this investigation into a more granular nature, in the past we reported that Barcelona was experiencing a significant increase in VLSFO sulphur notifications.

Barcelona, once a sulphur hot spot, has steadied. Borderline owner results in the 0.51 to 0.53% band have slipped to 1% from 2.9%, while outright exceedances now stand at 3% versus 11.6% in the prior review. The improvement tracks a 40% fall in HSFO liftings during the first half of 2025, limiting barge switching between HSFO and VLSFO and cutting residue carry over.

Our recent article relating to the Mediterranean Emission Control Area (Med ECA) landscape mentioned TSP issues that became prevalent in the basin around the 1st of May implementation date. This picture shall be updated later in this article.

Marine Gas Oil

Written by: Chris Turner, Manager of Bunker Quality & Claims

MGO Availability

LSMGO remains the most available of all conventional grades globally with 703 ports seen to supply it in June 2025.

Marine Gas Oil (0.5% sulphur) is not available inside the EU and limited to around 50 ports worldwide predominantly in West Africa, Brazil and the Middle East.

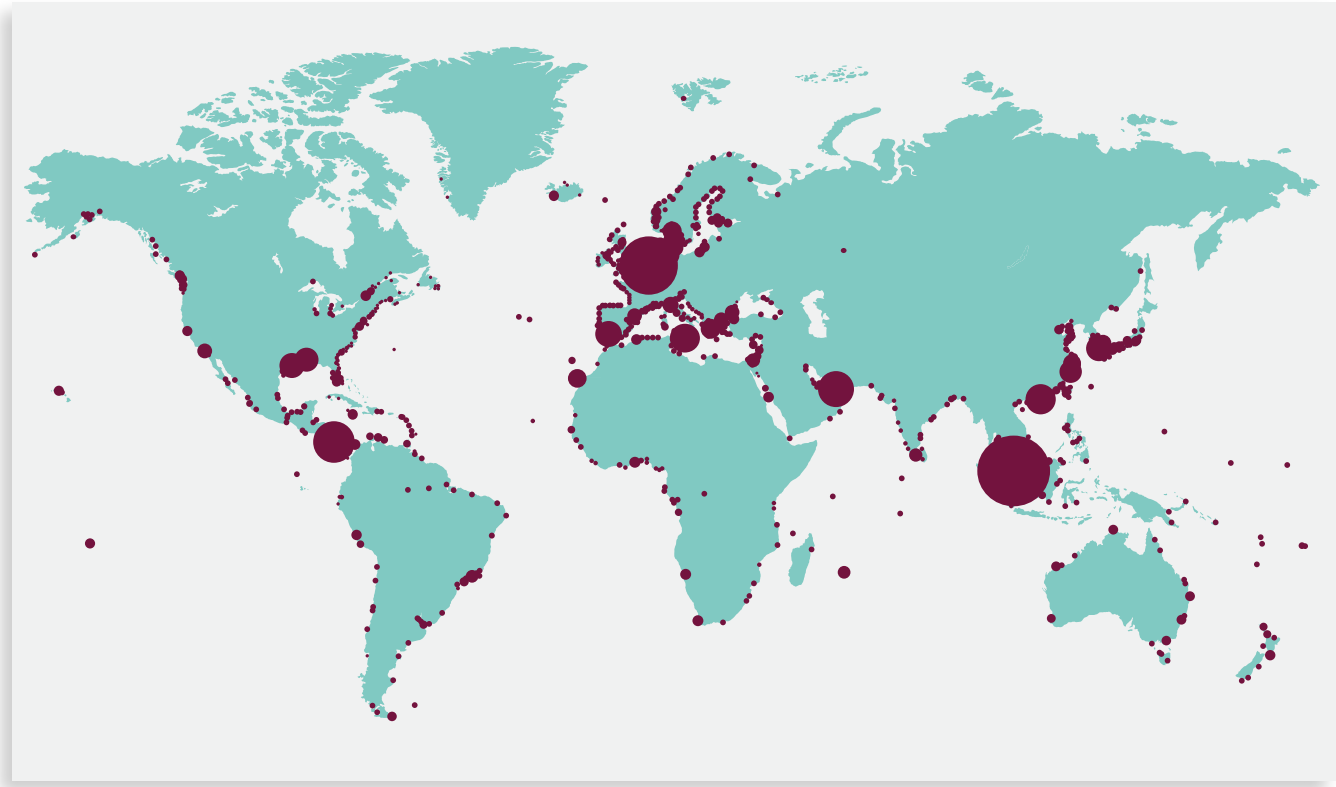


Figure 10: LSMGO availability H1 2025.

MGO Traded Specifications

Just over one third of recent LSMGO trades now cite ISO 8217:2017, up from a quarter in the previous review, while the 2010 table has slipped to a little over 60%.

The 2005 edition still accounts for about 5% of deals and the 2012 version barely registers.

The lingering use of 2005 is driven by viscosity, its minimum limit being 1.5 cSt, whereas every later revision requires 2.0 cSt. Suppliers expecting borderline low viscosity running quality in their area sensibly do not guarantee tighter limits, with the largest proportion of these being in the North East of the USA where over half of the fuels noted to breach the 2.0 cSt limit of DMA specification are identified.

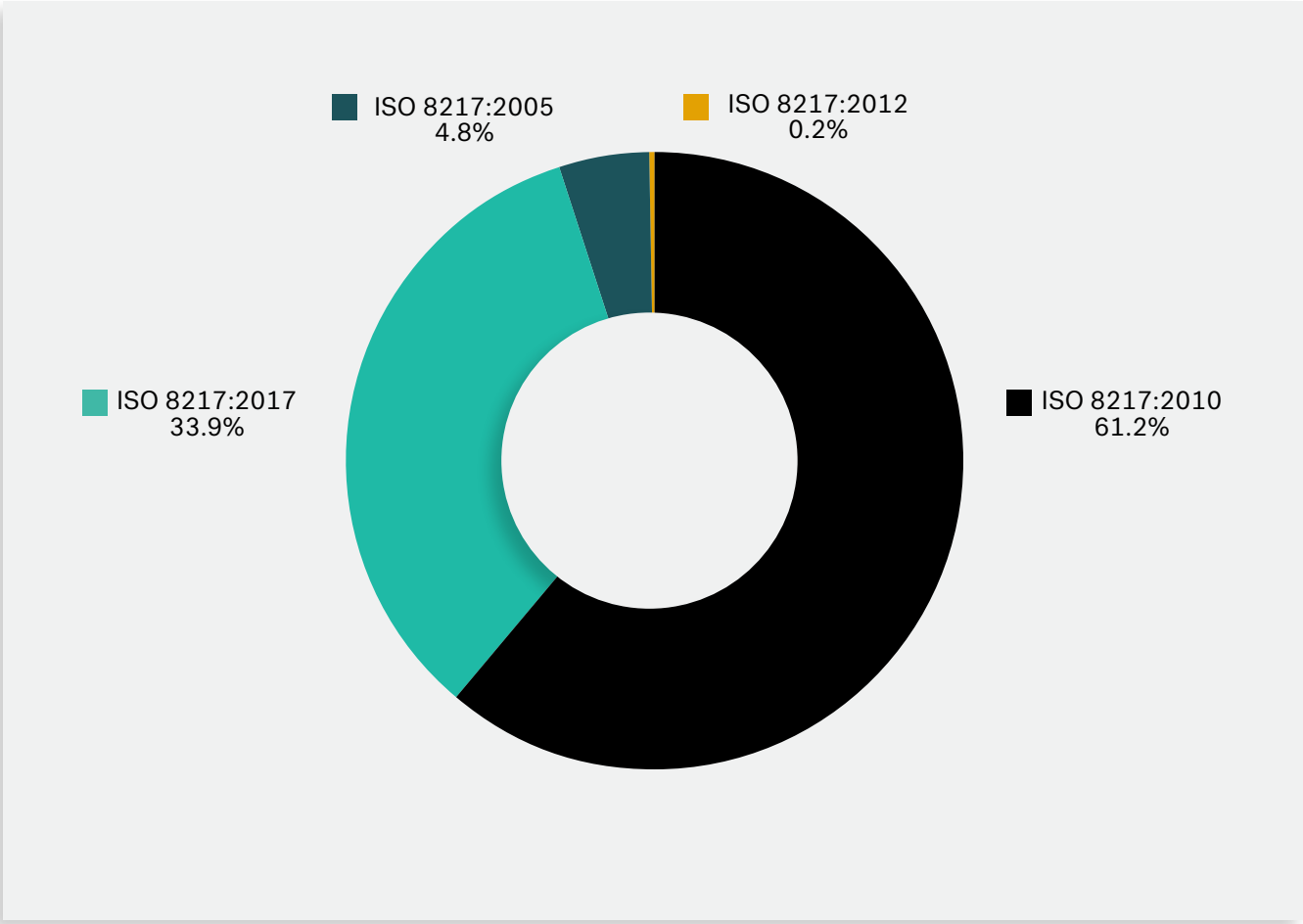


Figure 11: LSMGO traded specifications H1 2025.

An unusually warm summer in North West Europe can distract from the colder conditions soon to return across the North Atlantic, the Baltic, and the United States and Canadian ECAs. Many vessels will arrive in these waters on gas oil taken in much warmer ports. Figure 12 traces low sulphur marine gas oil moving from the ARA and broader North West European supply pool to West Africa and the eastern Mediterranean, where the new ECA is anchoring demand. Laboratory results show that a sizeable share of these cargoes are heavily additised, with cloud points above plus 10°C and pour points below minus 6°C, pointing to aggressive cold flow improver use at origin.

As a result, it is essential to always insist on a recent Certificate of Quality and, wherever possible, lift product sold against the ISO 8217:2024 specification, which obliges the supplier to state both cloud point (CP) and cold filter plugging point (CFPP). If the trading pattern demands extra assurance, write explicit CP or CFPP ceilings into the purchase clause and link price or acceptance to meeting those limits. Without those two steps the buyer carries the full risk of any cold flow failure once the fuel is on board.

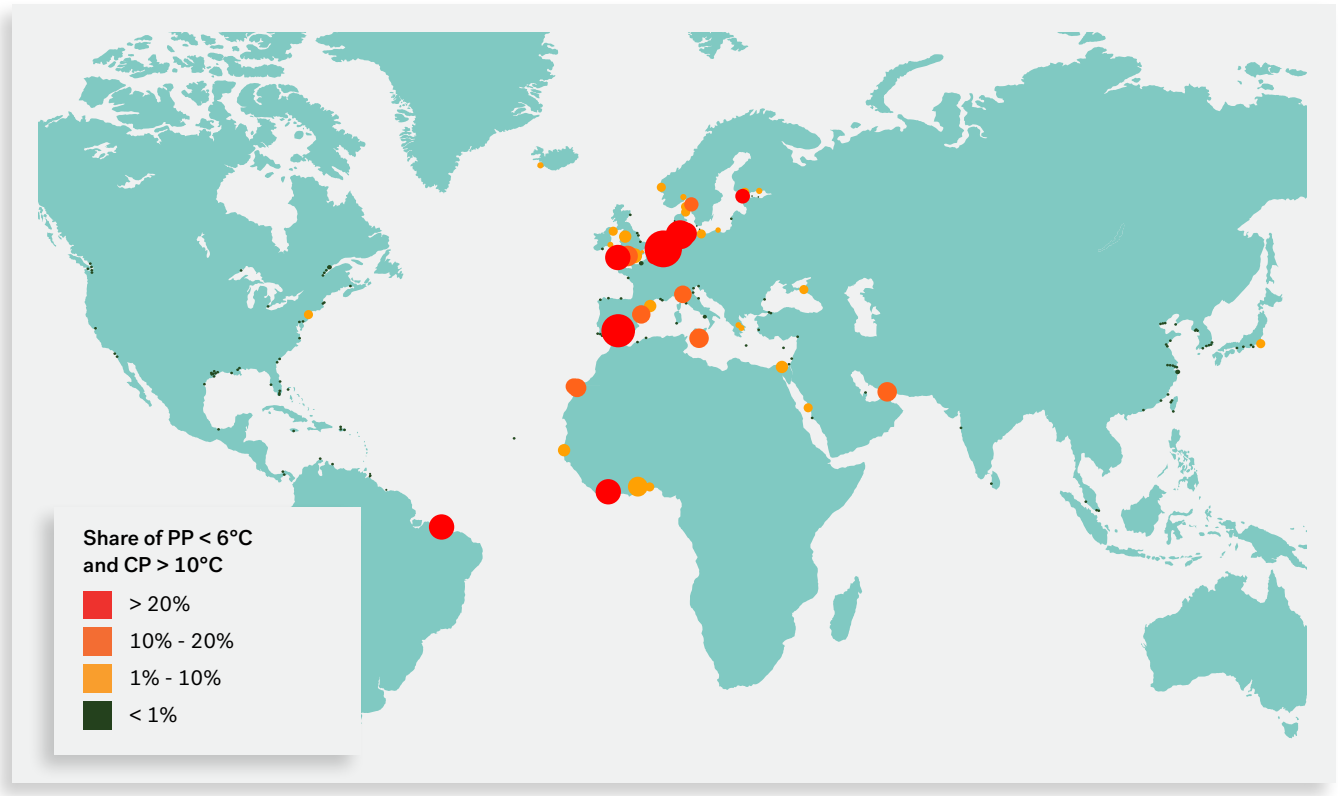


Figure 12: Fuels with potential cold flow challenges.

MGO Quality

Overall, 3.3% of LSMGO supplies tested beyond the 95% confidence limit for ISO 8217 table 1 characteristics, up from 2.8%. The proportion of fuels that may result in critical failures is edging lower, down from 1.9% to 1.5%.

Flash point has overtaken sulphur as the single largest driver of LSMGO off specs. In the period assessed, it accounted for roughly a third of all incidents, up from one quarter in the previous review. By contrast, sulphur's share slipped to 22%. Viscosity and cetane index, though still secondary concerns, both posted notable increases, pointing to a change in blending recipes.

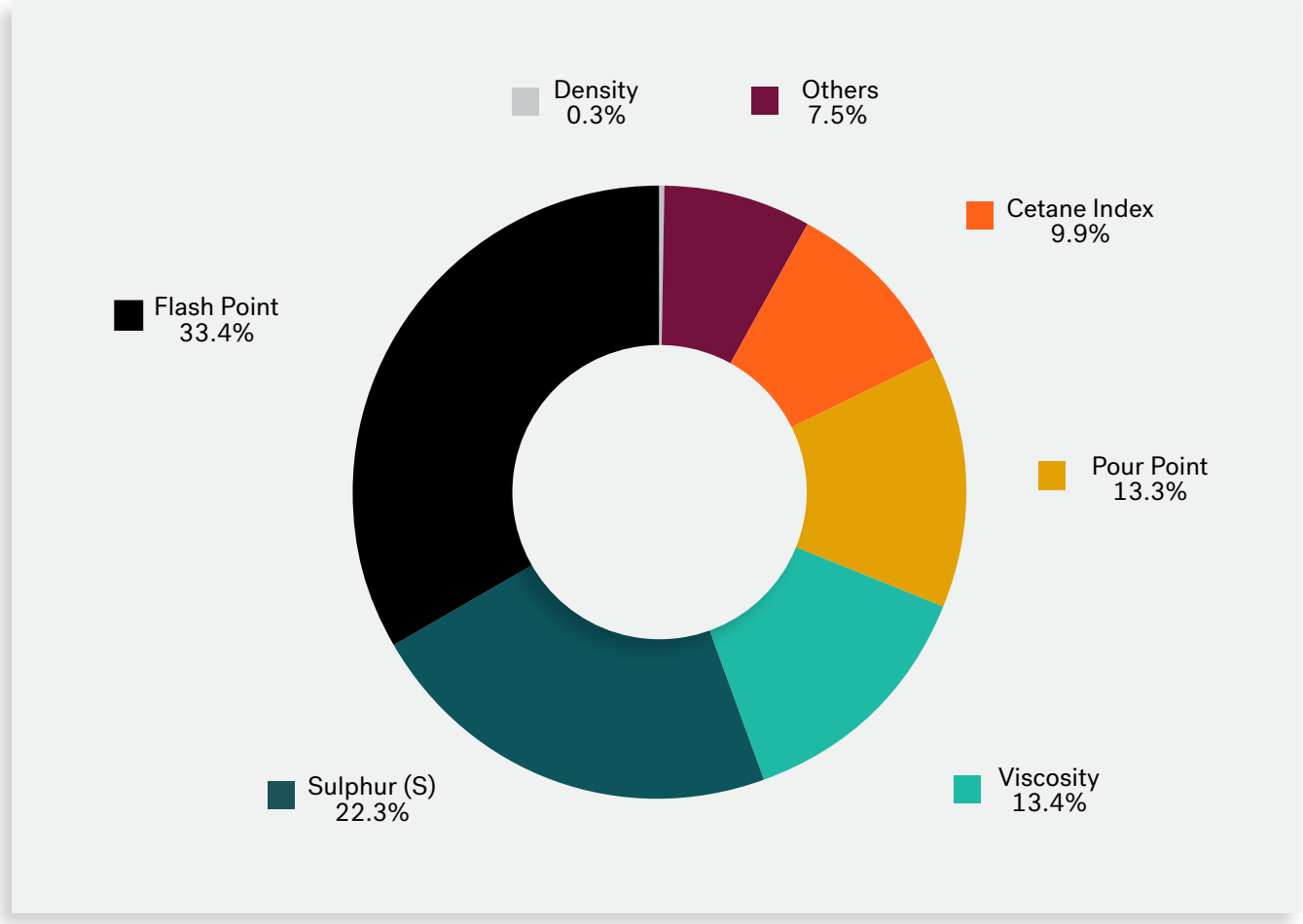


Figure 13: LSMGO parameters of fuels testing beyond 95% confidence limits.

On a more granular level, flash point results continue to show local hot spots; the UAE remains challenging, with significant port-to-port variance. Almost one in three LSMGO samples from Sharjah failed the SOLAS 60°C minimum at 29.2%, with Dubai close behind at 22.6%; Hamriyah came in at 6.7%, Jebel Ali at 9.1% and Khor Fakkan at 5.3%, all above the typical global baseline (figure 14), while Fujairah has remained fully compliant for almost one year. The national average therefore hides a tight cluster of risk around the northern terminals, and prudent operators should favour Fujairah for critical stems or insist on up-to-date certificates of quality given the increasing focus on SOLAS compliance.

Spain continues to show pockets of concern: Palma stands at 12%, Castellón 10% and Santander 9%, all well above the national average of roughly 5%. In Turkey, Aliaga at about 26% and Izmir at about 15% perform significantly worse than the higher volume port of Istanbul at roughly 3%. Market feedback links these Mediterranean issues to EN 590 automotive diesel entering the marine supply chain; this product is usually guaranteed at a 55°C flash point, five degrees below the SOLAS minimum, meaning fuel that is in specification for EN 590 can reach a vessel already outside the marine limit.

UAE fuels present a different hazard. Individual samples have tested below 50°C, pointing to episodic cross contamination rather than the routine low flash supply seen at Spain and Turkey's outlying ports.

UAE Port	Flash Pt % <60°C
Sharjah	29.2 (11.8)
Dubai	22.6 (4.9)
Hamriyah	6.7 (6.7)
Jebel Ali	9.1 (4.4)
Khor Fakkan	5.3 (0.9)
Fujairah	0.0 (0.0)

Figure 14: LSMGO flash point testing below 60°C in UAE ports last 180 days (previous % in brackets).

Ultra Low Sulphur Fuel Oil

Written by: Chris Turner, Manager of Bunker Quality & Claims

ULSFO Availabilty

From H2 2024 to H1 2025, the number of ports offering ULSFO (max 0.10% sulphur) has risen to 38 – a 73% increase in supply footprint.

Availability is highly concentrated in North West Europe, the Baltics, and the Mediterranean, aligning closely with ECA zones. Growth has been primarily driven by demand ahead of the Mediterranean ECA's May 2025 entry into force.

The most significant jump occurred between March and April, with port coverage increasing from 21 to 30, then rising again in May (36) and June (38). Suppliers appear to be responding quickly to compliance-linked demand signals, particularly in Med-facing ports and key transit hubs.



Figure 15: ULSFO availability H1 2025.

Supply is concentrated around key bunker hubs such as Algeciras and ARA, with this predominantly orientated around oil majors and large blenders, rather than smaller independent suppliers whose infrastructure typically does not support an additional residual grade, particularly given the previously weak demand signals.

Customers operating vessels on fixed liner-type routes are well positioned to secure ULSFO supply contracts at key hubs. This, in turn, concentrates business around the larger suppliers. With predictable trading patterns and repeat port calls, these operators can commit to ULSFO without the operational risk of switching back and forth from VLSFO within the fuel system.

Anecdotal feedback from Integr8's supply network suggests that ULSFO availability is firming in key ports. Supply is currently reported as stable in Algeciras, Barcelona, Rotterdam, and Antwerp, with lead times typically ranging from 7 to 10 days.

ULSFO Quality

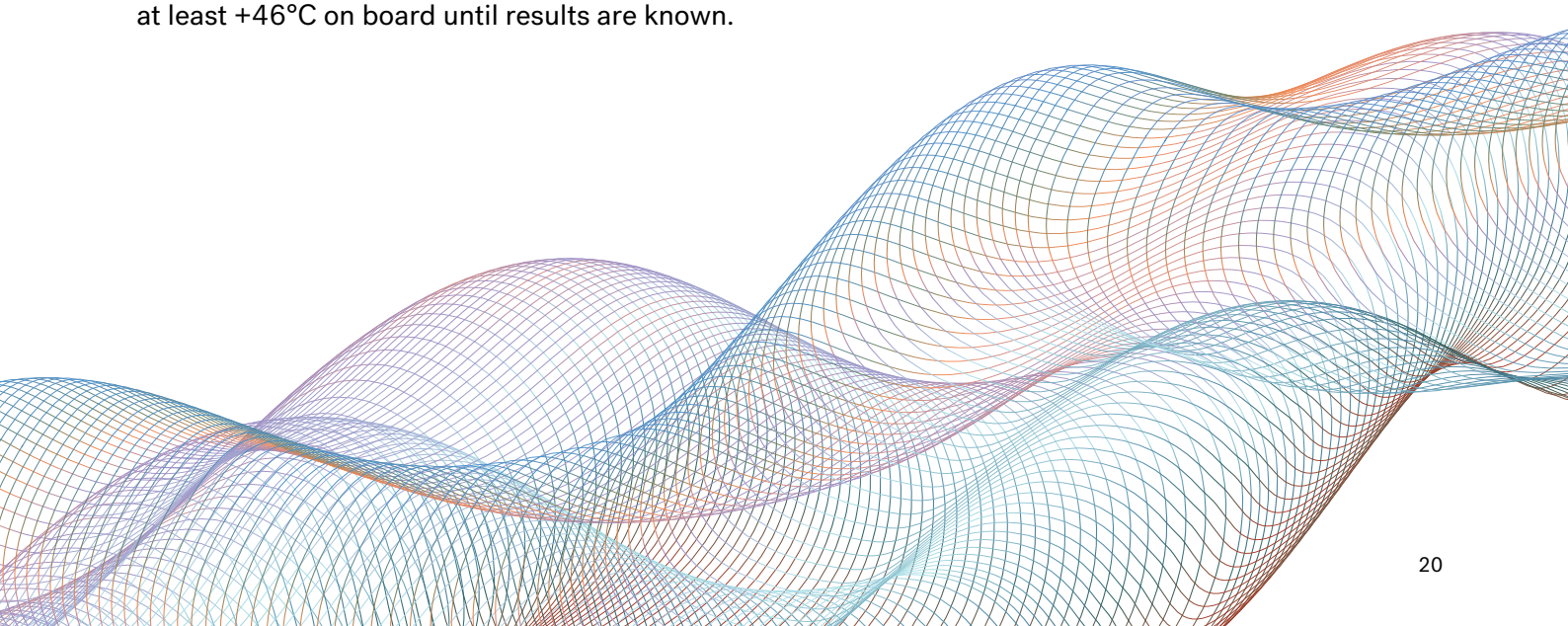
ULSFO has the highest rate of owner test results breaching ISO 8217 specification limits, with 3.5% of all samples tested falling outside required parameters.

While the number of critical cases (such as TSP) remains low at just 0.4%, the data reveals that over one third of all breaches relate to sulphur notifications.

Incidences of elevated pour point have been highlighted and given the noteworthy levels of +36°C, it would be prudent to maintain fuels to at least +46°C on board until results are known.

Total Sediment Potential accounted for just under 10% of breaches, pointing to sporadic and isolated instability in certain locations.

No incidents were recorded against flash point, water content, cat fines or other ISO parameters in this period.



Implementation of the Mediterranean ECA

Written by: Chris Turner, Manager of Bunker Quality & Claims

The Changing Med ECA Fuel Mix

Our **July 2025 whitepaper** highlighted step changes in bunker volumes and quality in the Med basin.

With another month's data now available, we can perform a timely refresh and home in on certain trends to see whether they have come to fruition or were a temporary blip, as is often the case. Firstly, the fuel mix in the region is still realigning but has stabilised somewhat, as can be seen in figure 16.

From December 2024 to June 2025, the Mediterranean fuel mix has shifted significantly. In December, VLSFO covered just over 60% of all stems; by May it had dropped to 37.5% and further declined in June to just 35.6%. LSMGO rose from 13% in December to 29.5% in May and inched upwards to 30.2% in June. HSFO followed scrubber demand, moving from 26.6% in December to 29.4% in May and all but stabilised to 30.1% in June. ULSFO, almost absent at year-end, increased from 0.3% in December to a small but equally significant 3.6% in May and 4.1% in June.

Fuel Grade %	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
VLSFO	60.1	59.5	59.1	54.3	46.7	37.5	35.6
HSFO	26.6	26.6	27.4	29.0	30.6	29.4	30.1
LSMGO	13.0	13.3	13.0	15.8	20.7	29.5	30.2
ULSFO	0.3	0.6	0.5	0.9	2.0	3.6	4.1

Figure 16: Med ECA fuel supply share by grade %.

Two trends stand out. Most of the realignment took place ahead of the 1 May start of the ECA, when VLSFO ceded share to LSMGO and ULSFO as operators prepared for the 0.10% sulphur limit. June shows a slower rate of change, suggesting consolidation. Residual grades still supply about two-thirds of the market, but fuels at or below 0.10% sulphur have grown from less than 15% in December to roughly one third by June, confirming the structural impact of the Med ECA.

Med ECA VLSFO Quality

June and early July data show VLSFO quality infraction rates across the Mediterranean basin easing back toward first half norms.

After the May peak near 4%, the off spec share has settled to around 2.5%, suggesting that the most acute blend instability tied to the VLSFO wind-down has passed. Issues have been largely confined to smaller or secondary locations, with key bunkering hubs such as Gibraltar and Algeciras remaining within acceptable quality ranges.

Sulphur remains the most common cause of failures, followed by sediment potential and occasional water issues. This pattern mirrors the early months of ECA enforcement and reflects routine variability rather than systemic quality degradation. Buyers can take reassurance that overall VLSFO quality is stabilising, while still maintaining vigilance through certificate checks and targeted testing on new fuel batches.



Med ECA LSMGO Quality

Recent June and July owner tests confirm that the LSMGO risk landscape outlined in our June 2025 whitepaper is unchanged.

Overall, table 1 non-conformance is again tracking close to 2%, and low flash point remains the chief culprit, accounting for more than 80% of all deviations and often coinciding with viscosity below 3 cSt.

The geographical pattern is likewise stable: the highest concentration of incidents persist around Castellón–Valencia, along Italy's western seaboard, and in western Turkey. Figure 17 underscores this continuity by mapping the share of deliveries that breach both the 60°C flash point minimum and the 3 cSt viscosity floor, the same hotspots dominate – confirming that little has changed since publication of the whitepaper three months ago.

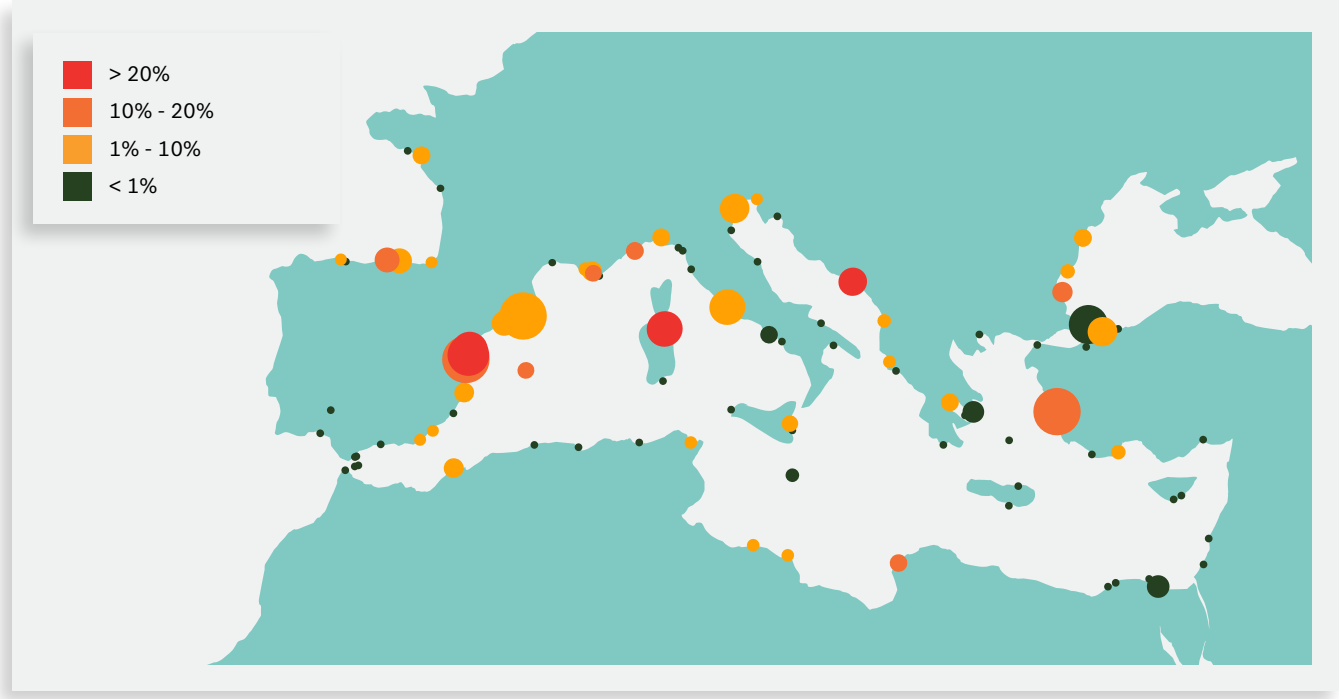


Figure 17: Low viscosity <3 cSt combined with low flash point <60 °C.

Med ECA ULSFO Quality

ULSFO remains the most vulnerable grade in owner testing. Globally, 3.5% of samples taken in the first half of 2025 failed to meet ISO 8217 limits, rising slightly to around 4% in June and July.

In the Mediterranean ECA over the same two month period, about half of the reported issues were due to sulphur exceeding the 0.10% limit, roughly a quarter were linked to high pour points (up to +36°C), and only one case involved a TSP failure. On a positive note, sulphur-related notifications fell noticeably from June to July, indicating that the initial surge in quality issues following the ECA's introduction is easing.

Biodiesel

Written by: Chris Turner, Manager of Bunker Quality & Claims

Biodiesel Quality

Headline notifications for B100 and LSMGO-30 exceed 15%, but once pour point cases are removed, non-pour point notifications fall to 2.1% and 3.8%.

That places both grades in line with the conventional fuels discussed earlier in this report, with critical findings limited to 1.6% for B100 and 2.1% for LSMGO-30.

ULSFO-30 and HSFO-30 record no notifications in this period. VLSFO-30 stands at 4.1% beyond the 95% confidence limit, with 3.7% classed as compliance and 0.4% as critical. Pour point is not a driver for these residual blends. Overall, the residual biofuel blend risk profile remains low.

Fuel Grade	Beyond 95% Conf. %	Compliance %	Critical %	High Risk %	Excluding Pour Point %
B100	15.6	-	1.6	1.6	2.1
LSMGO-30	16.5	2.7	2.1	4.8	3.8
ULSFO-30	0.0	-	-	-	0.0
VLSFO-30	4.1	3.7	0.4	4.0	4.1
HSFO-30	0.0	-	-	-	0.0

Figure 18: Types and frequencies of notification by grade for biofuel blends (blank indicates no occurrences, HVO data not available).

B100 Quality

Neat biodiesel (B100) characteristics are shaped by the feedstock used in its manufacture.

Pour point measurements range from –6°C (the DMA winter specification) to above 12°C. End users should therefore be prepared for elevated pour points when colder climates are expected, which may require the fuel to be heated so that it remains at or near its cloud point, or, where feasible and effective, dosed with a cold flow improver to prevent handling issues on board.

Average total acid number (TAN) sits at about 0.31mg KOHg, roughly twice the level typically measured in DMA, signalling some fatty acid formation through oxidation (though still below the DMA ceiling of 0.50mg KOHg).

Although antioxidants are routinely blended into fatty acid methyl ester (FAME) to slow this process, degradation accelerates under heat; therefore, the higher storage temperatures often used to mitigate cold flow issues can, over time, drive TAN even higher.

Entrained water in B100 averages about 0.03% m/m, yet the fuel readily absorbs moisture, so tanks must be stripped and bottoms drained on a routine basis. Persistent water encourages microbial growth; a preventive biocide dose should therefore be applied early rather than waiting for infestation to take hold when it is already too late.



Distillate B30 & B100 Quality

Pour point is the clear driver, responsible for just over 60% of the recent B100 and B30 non-conformities and underscoring the cold flow sensitivity that comes with certain feedstocks.

Only a single flash point failure appears in the data within a B30 parcel, suggesting the mineral fuel being the root cause. Viscosity issues are marginal at under 8% and likely reflect blending rather than underlying fuel chemistry.

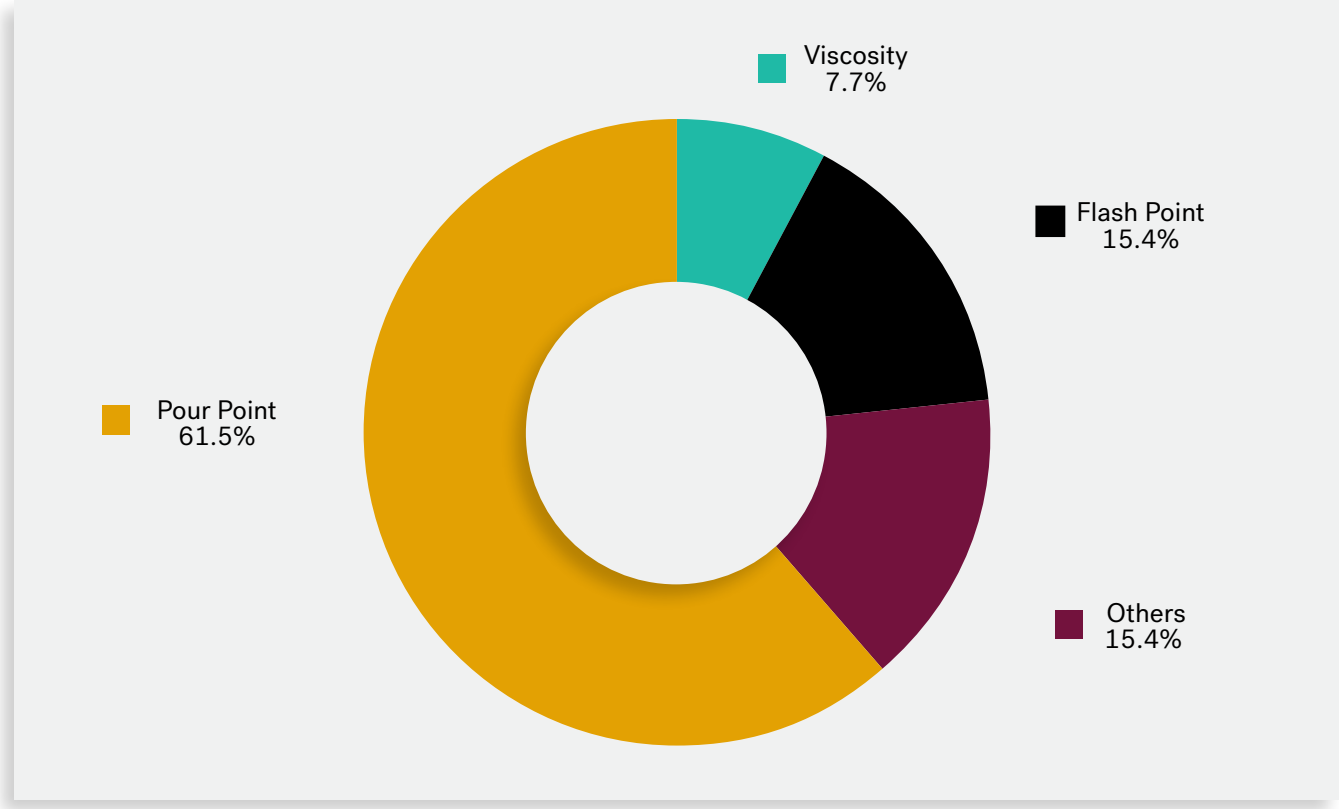


Figure 19: Breakdown of distillate based B30 and B100 qualities.

Residual B30 Quality

Across all B30 residual blends reviewed, no ISO 8217 breach arises when the 2010 or 2017 RMG limits are applied at point of sale: density, sulphur, pour point and TAN all sit within their respective thresholds.

Neat FAME is only 4–6 cSt at 40°C, so every percent added into a residual base pulls viscosity down; current B30 averages are ~20 cSt for ULSFO, ~50 cSt for VLSFO and ~75 cSt for HSFO – far below the 120 cSt minimum that applies to RF 380 under ISO 8217:2024, even though they remain compliant with the legacy RMG/RMD specs still commonly used.

Unlike distillate RF grades, pour point is not relevant, with the root cause of problems often being associated with the mineral fuel rather than the biofuel component itself.

Biofuel Pricing Beyond Face Value

Written by: Erik Hoffmann, Managing Editor, ENGINE

Compounding regulations are making biofuels attractive for intra-EU journeys

Many shipping companies have been exposed to biofuels for the first time in recent months.

Previously, they only had to decide between fuel oils and gas oils, or LNG or methanol if they had dual-fuel ships.

Looking at the outright price tags of biofuels they look prohibitively expensive. Why would anyone in their right mind pay well over $1,000/mt to bunker pure biofuel when they don't have to?

Biofuel sceptics will say that the EU Emissions Trading System (EU ETS) and FuelEU Maritime regulations are already in effect, but that the EU ETS carbon price is low and that FuelEU only has a 2% greenhouse gas (GHG) intensity reduction target until 2030. And the global Carbon Intensity Indicator (CII) will remain toothless until it is revisited.

At face value, it's better to eat EU ETS carbon price costs, pay FuelEU penalties and ignore the CII for a while longer. But here is the kicker: these regulations compound to make pure fuel oils and gas oils less attractive compared to biofuels consumed in moderation and with a bit of planning.

Cut carbon and costs

For example, if you buy 100% biodiesel (B100) in Rotterdam, the physical supplier delivering it to you will generate so-called HBE tickets that are tradeable in a market for a value.

That value is currently around $450/mt for B100. Theoretically, most of that HBE ticket value should be passed on as an HBE-rebate to bunker buyers.

We have seen that this HBE ticketing system has created very competitive pricing in Dutch ports compared to Belgian ports. VLSFO prices are tightly correlated in Rotterdam and Antwerp, and ENGINE's Rotterdam VLSFO benchmark has averaged just $0.25/mt lower than that for Antwerp in the past year. The story is very different for ENGINE's B100 as Rotterdam's benchmark has averaged $332/mt lower than Antwerp's.

So that's the first hack. The second hack is to burn biofuel in a 0.10% sulphur-capped Emission Control Area in Europe or North America. If you swap more expensive LSMGO or ULSFO grades for naturally low-sulphur B100, your price delta will be much smaller than if you had burned biofuel instead of VLSFO or HSFO.

Thirdly, make sure that you burn the biofuel on voyages between two EU ports so that 100% of your emissions count toward the EU ETS and FuelEU regulations. Remember that it's the average GHG intensity reduction across your fleet of EU-trading ships over a calendar year that counts towards FuelEU. For EU ETS, qualifying biofuels have a carbon factor of zero, meaning that you don't pay anything to burn them. And you want to get value from your non-penalised biofuel by consuming it where the EU regulations bite the hardest: between EU ports.

Now let's take that a step further to take advantage of the full swathe of regulatory opportunities. FuelEU has a pooling mechanism which allows shipping companies with undercompliant and overcompliant ships to trade compliance surpluses with one another in over-the-counter markets.

Pricing is opaque in these compliance markets, but if we take a conservative view and price the pooling value equal to the cheapest compliance option, which is biofuels, then the compliance value comes to just shy of $700/mt for B100 consumed between two EU ports.

Overcompliant shipping companies that pool with others will be able to recapture much of the extra costs they have splashed out on biofuels with seemingly higher price tags. They will also avoid FuelEU $69/mt penalties for burning either HSFO or VLSFO between EU ports, or $42/mt for LSMGO. And they will avoid $184-189/mt EU ETS carbon costs for these three fossil fuels.

While the regulations don't bite in isolation, they compound to tip the scales in favour of B100 and away from high-emission fuel oils and gas oils, which are increasingly penalised.

ENGINE's July 2025 Fuel Switch Snapshot demonstrates the true cost of buying and burning various fuels in the EU. Looking at the second line of figure 20, you can see that B100 costs around $600/mt in Rotterdam with the costs and benefits of EU regulations included. That is a discount of about $100/mt to HSFO, $150/mt to VLSFO and $300/mt to LSMGO.

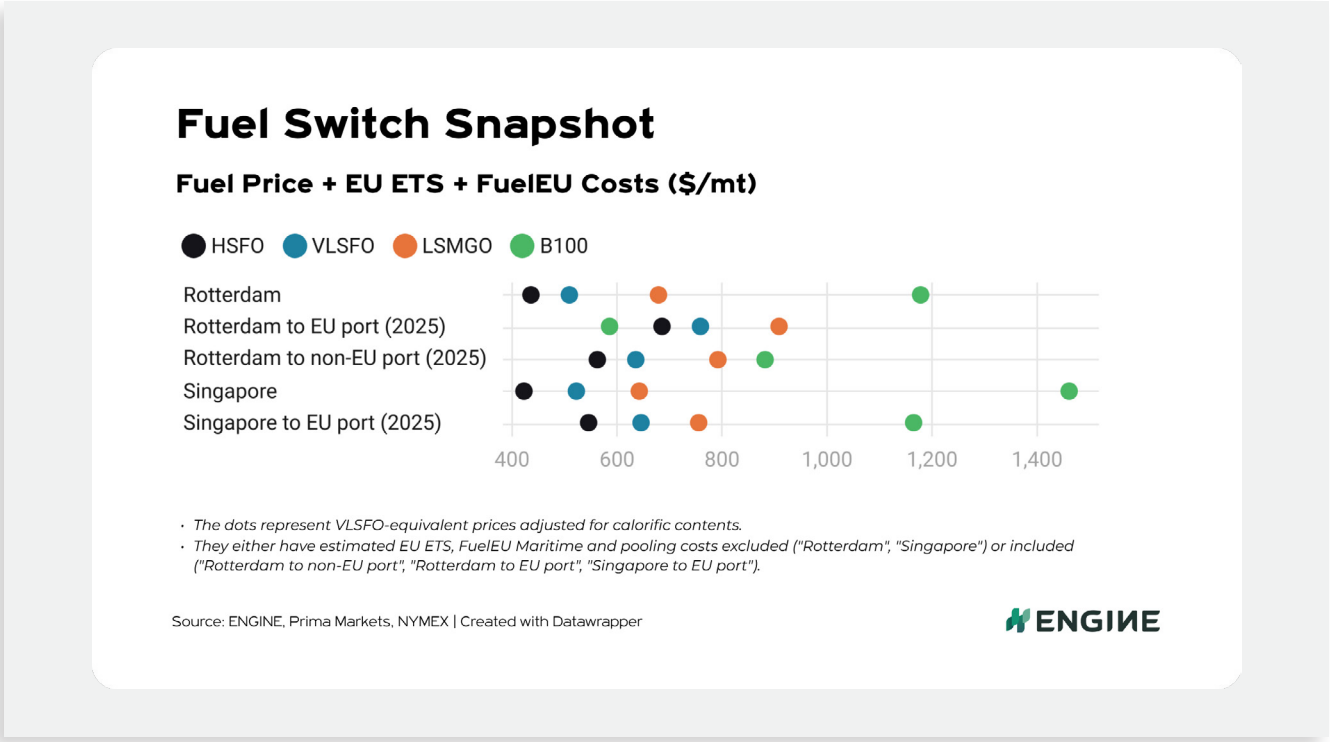


Figure 20: The 'real' cost of burning traditional vs. alternative fuels – with regulatory costs, pooling benefits and government rebates considered, July 2025.

Conclusion

Written by: Chris Turner, Manager of Bunker Quality & Claims

The first half of 2025 confirms that marine fuel quality is broadly sound, yet stress fractures are beginning to show where trade routes, cargo blends and new sulphur limits intersect, with traditional availabilities now morphing into a new norm.

Ultra low sulphur grades, whilst still only accounting for 4% of Mediterranean supply, are meeting fresh demand, but that surge has already exposed localised pour point and sulphur issues. The rapid increase in LSMGO demand in the Med has also highlighted flash point concerns that linger in smaller outlying ports that rely on automotive diesel for marine supply.

Biofuels remain niche by volume but used with discipline they are a practical tool rather than a statement. The most effective approach is route led, targeting lanes where regulation, supply certainty and vessel schedules align to deliver measurable emission cuts at a controlled total cost, with safeguards in place for buying, housekeeping and storage.

The takeaway is simple: the barrels are there, but they are changing character faster than many historic buying models.

Meanwhile, as the sanctions regime tightens further, barrels once available are being replaced by Middle Eastern cargoes, shifting the risk matrix in high sulphur fuel oil toward ash and sodium management.

Relevance is now the true currency of the bunker market. Buyers who invest in live data, sharpen their alternative fuel knowledge, and lock specifications to the lessons of IMO 2020 will outpace those who wait for regulation to dictate their next move. New ECAs, the EU climate package and a wave of carbon intensity rules will tighten the net year by year; doing nothing might still be possible today, but it is a direct route to tomorrow's exit. Staying relevant means treating quality analytics, legislative foresight and training in emerging fuels as core competencies, not optional extras. The prize for those who adapt is a more resilient, transparent and ultimately more professional industry.

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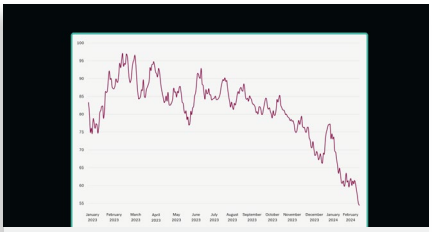
Additional Resources

Access insights and tools for better bunkering decisions at integr8fuels.com.



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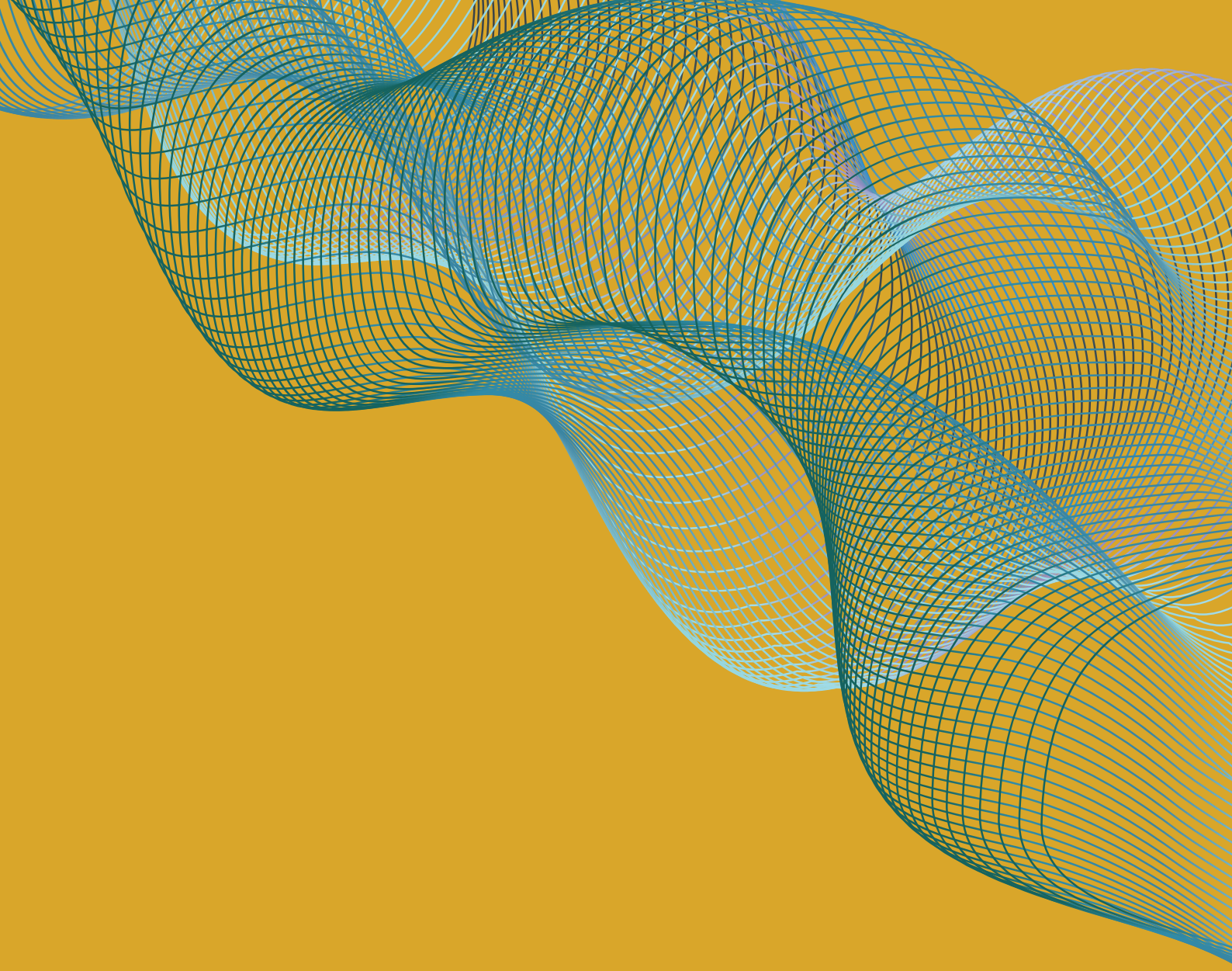

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