S&P Global
Platts

Oil

Specifications guide
Asia Pacific and Middle East refined oil products

Latest update: September 2019

DEFINITIONS OF THE TRADING LOCATIONS FOR WHICH PLATTS PUBLISHES DAILY INDEXES OR ASSESSMENTS

The following specifications guide contains the primary specifications and methodologies for Platts refined oil products assessments throughout Asia Pacific and the Middle East. All the assessments listed here employ Platts Assessments Methodology, as published at https://www.spglobal.com/platts/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/platts-assessments-methodology-guide.pdf.

These guides are designed to give Platts subscribers as much information as possible about a wide range of methodology and specification questions.

This guide is current at the time of publication. Platts may issue further updates and enhancements to this guide and will announce these to subscribers through its usual publications of record. Such updates will be included in the next version of this guide. Platts editorial staff and managers are available to provide guidance when assessment issues require clarification.

STRAITS TERMINALS

Terminal	Location	No. of Berths	Maximum draft (m)	Maximum LOA (m)/vessel type	No. of tanks	Storage capacity (cu m)	Ownership	Platts Gasoline	Platts Jet	Platts Gasoil	Platts HSFO
Helios	Jurong Island	6+1 (VLCC)	18.5/24.5 (VLCC)	280/353 (VLCC)	18	503,408	55% Oiltanking GmbH; 45% Macquarie	No	No	No	Yes
Universal	Jurong Island	6	23	333/VLCC	78	2,360,000	65% Hin Leong; 35% PetroChina	Yes	Yes	Yes	Yes
Horizon	Jurong Island	7	16.5	333/VLCC	59	1,243,990	JV between Horizon Terminals Ltd (52%) and four partners SK Corp, Independent Petroleum Group, Boreh International, Martank	Yes	Yes	Yes	Yes
Tankstore	Pulau Busing, Bukom Island	11	17.1	360	107	2,000,000	100% PB TANKER (Kuo International (Pte) Ltd)	Yes	Yes	Yes	Yes
SRC	Jurong Island	7	15	290/up to 105,000 dwt		1,904,762	50% Chevron; 50% PetroChina (through SPC)	Yes	Yes	Yes	Yes
Oiltanking	Jurong Island	11	15.7	335	80	1,305,444	55% Oiltanking GmbH; 45% Oystercatcher	Yes	Yes	Yes	Yes
Shell Bukom	Pulau Bukom	9				3,900,000	100% Shell	Yes	Yes	Yes	Yes
XOM Jurong	Jurong	5				2,310,000	100% ExxonMobil	Yes	Yes	Yes	Yes
XOM PAC	Jurong Island	6				1,700,000	100% ExxonMobil	Yes	Yes	Yes	Yes
Tuas	Jurong	1	10.2 (without tide)	280	1	60,000	100% Huaneng Power International	No	No	No	Yes
Vopak Sebarok	Pulau Sebarok	9	17.6	280/Half Laden VLCC	79	1,263,079	100% Vopak Terminals Singapore (69.5% Vopak; 30.5% PSA Corp)	Yes	Yes	Yes	Yes
Vopak Banyan	Jurong Island	7	15.5	260/Aframax	60	1,025,339	100% Vopak Terminals Singapore (69.5% Vopak; 30.5% PSA Corp)	Yes	Yes	Yes	Yes
Chevron Penjuru	Jurong	7	14.8	300	40	485,600	100% Chevron	Yes	Yes	Yes	Yes
Power Seraya	Jurong Island	4	12.6	275/Suezmax	20	835,000	100% YTL PowerSeraya	No	No	Yes	Yes
Senoko Power	Woodlands	1	12	277	7	260,000	Senoko	No	No	Yes	No
SPC	Pulau Sebarok	3	17	297/120,000 dwt	13	220,000	100% PetroChina	No	Yes	Yes	Yes
Exxon SCP Banyan facility	Jurong Island	3	17	290	2 tanks each for gasoil, jet/kero	60,000 each for gasoil, jet/kero	100% ExxonMobil	No	Yes	Yes	No
Jurong Port Tank Terminals	Jurong	4	17.6	274/180,000 dwt	19	252,000	60% Jurong Port Pte Ltd; 40% Oiltanking GmbH	Yes	No	No	No
Dialog Terminals Langsat	Tanjung Langsat, Johor	7	13.5	430/partially laden VLCC	42 (DTL1: 32; DTL2: 10)	647,000 (DTL1: 476,000; DTL2: 171,000)	100% Dialog Terminals	Yes	Yes	Yes	Yes
Tanjung Bin	Tanjung Bin, Johor	6	17.5	fully-laden Suezmax or partially laden VLCC	41	890,000 and another 250,000 by mid-2015	100% VTTI	Yes	Yes	Yes	Yes
Tanjung Pengerang	Pengerang, Johor	6	24	350 (VLCC)	57	1,284,000	90% Pengerang Terminals Sdn Bhd (51% Dialog Group Bhd; 49% Royal Vopak); 10% SSI* (Johor) * SSI=State Secretary Inc.	Yes	Yes	Yes	No

STRAITS TERMINALS

Terminal	Location	No. of Berths	Maximum draft (m)	Maximum LOA (m)/vessel type	No. of tanks	Storage capacity (cu m)	Ownership	Platts Gasoline	Platts Jet	Platts Gasoil	Platts HSFO
Pasir Gudang (Far East Oil Terminal One)	Pasir Gudang, Johor	4	13.5	290 (Aframax)	16	231,000	Cosco-Feoso (S) Pte Ltd (JV between Cosco Holdings (S) Pte Ltd and Feoso Investment (S) Pte Ltd)	No	No	No	Yes
Oiltanking Karimun Terminal	Karimun Island, Indonesia	4	23	346/partially laden VLCC	30	730,000	Oiltanking GmbH and Gunvor Group	Yes	Yes	Yes	No

Terminal information provided for reference only and reflects most recent available data.

FOB Straits Nomination Standards

Platts editorial standards for the Market On Close assessment process for FOB Singapore fuel oil, gasoil, gasoline and jet fuel calls for best practices in all aspects of operational performance, including terminal and vessel nominations.

Location basis for bids, offers and trades: Platts FOB Singapore assessments reflect "FOB Straits" bids, offers and transactions wherein sellers should proceed to nominate loading from one of the locations in Singapore and Malaysia that are approved for the Platts MOC price assessment process and are listed in the table.

Platts only publishes bids, offers and expressions of interest to trade for FOB Straits fuel oil, gasoline, gasoil and jet cargoes for which the following standards would apply: Sellers must declare a terminal 10 days prior to the first day of the loading window, and buyers should nominate a single performing vessel seven days prior, with the buyer narrowing the loading window to three days, subject to loading terminal acceptance. All nominations should typically be communicated to counterparties by 5 pm Singapore time.

If the nomination day falls on a weekend or a public holiday, nominations should be done on the business day prior to the weekend or public holiday. Buyers may submit multiple vessels for terminal vetting prior to nominating a performing vessel, and buyers may substitute the vessel prior to loading, subject to terminal acceptance.

Platts expects parties to be reasonable when exceptional circumstances require buyers to substitute vessels or sellers to substitute terminals after the respective nomination deadlines. Sellers should not unreasonably withhold vessel substitutions or hamper the established loading process. If the substituted vessel tendered the notice of readiness in time for loading, sellers should not put buyers on best endeavor basis.

Nomination of "non-commensurate" vessels should not expose the seller to incur additional costs associated with the large-sized vessels. The buyer has the right to nominate a non-commensurate vessel to load a cargo traded via the Singapore MOC assessment process, while the seller has the obligation to accept a commensurate vessel and try to accommodate a non-commensurate vessel if the terminal scheduling permits. The seller's exposure to demurrage and laytime should not exceed the normal associated demurrage and laytime, of a commensurate vessel.

For fuel oil loadings, Platts understands that up to Aframax-size tankers are considered commensurate; for middle distillates loadings, up to medium range tankers are considered commensurate; for gasoline loadings, small range tankers are considered commensurate for individual clips and up to MR tankers for co-loading of cargoes.

Any terminal nominated for performance on an FOB Straits transaction concluded during the Platts assessment process should typically be able to manage at least one co-load of standard-sized cargoes of 20,000 mt to 40,000 mt, for fuel oil, and 100,000 barrels to 250,000 barrels for jet fuel and gasoil.

For instance, a vessel which is already carrying 20,000 mt of fuel oil should be able to load at least another 20,000 mt from a second terminal, without draft restrictions hindering a vessel's ability to leave the port.

Seller should promptly communicate to buyers when substituting a terminal. The substitute terminal should conform to the nominated vessel and should not harm the buyer or affect any prior agreement between the counterparties regarding physical performance of the trade, unless with mutual consent.

All parties to a transaction are expected to demonstrate reasonability around alternative delivery arrangements. These arrangements include, but are not limited to, co-loading of cargoes or inter tank transfers. Parties to a transaction may not unilaterally assume that the counterparty is bound to accept the alternative delivery arrangement -- any such request should be clearly communicated and mutually agreed to prior to nomination of the performing vessel seven days prior to loading.

Buyers and sellers should not unreasonably withhold counterparty's request for alternative loading arrangements. Any direct additional costs incurred by the seller in fulfilling the alternative delivery may be borne in line with standard industry practice by the party requesting the arrangement.

If requested, sellers should demonstrate the additional costs incurred, for example any fees related to inter tank transfers, to their counterparty. Where the laycans for co-loaded cargoes are spread apart, the party requesting alternative loading arrangement may be expected to compensate the counterparty

for any difference in cargo value.

From July 3, 2017, Platts began publishing standalone offers of oil product cargoes loading from PT Oiltanking Karimun Terminal, Indonesia, in the Singapore MOC assessment process for gasoil, jet fuel and gasoline. Platts publishes such offers on an FOB Indonesia (FOB ID) basis, where the seller must clearly state the loading point as FOB Karimun at the time of communicating their interest to Platts for publication. Platts does not publish FOB Indonesia bids. For trades reported on FOB Straits basis, sellers may not unilaterally nominate Karimun as a delivery point, though it may be agreed by mutual consent, and should deliver from approved terminals in Singapore and Malaysia.

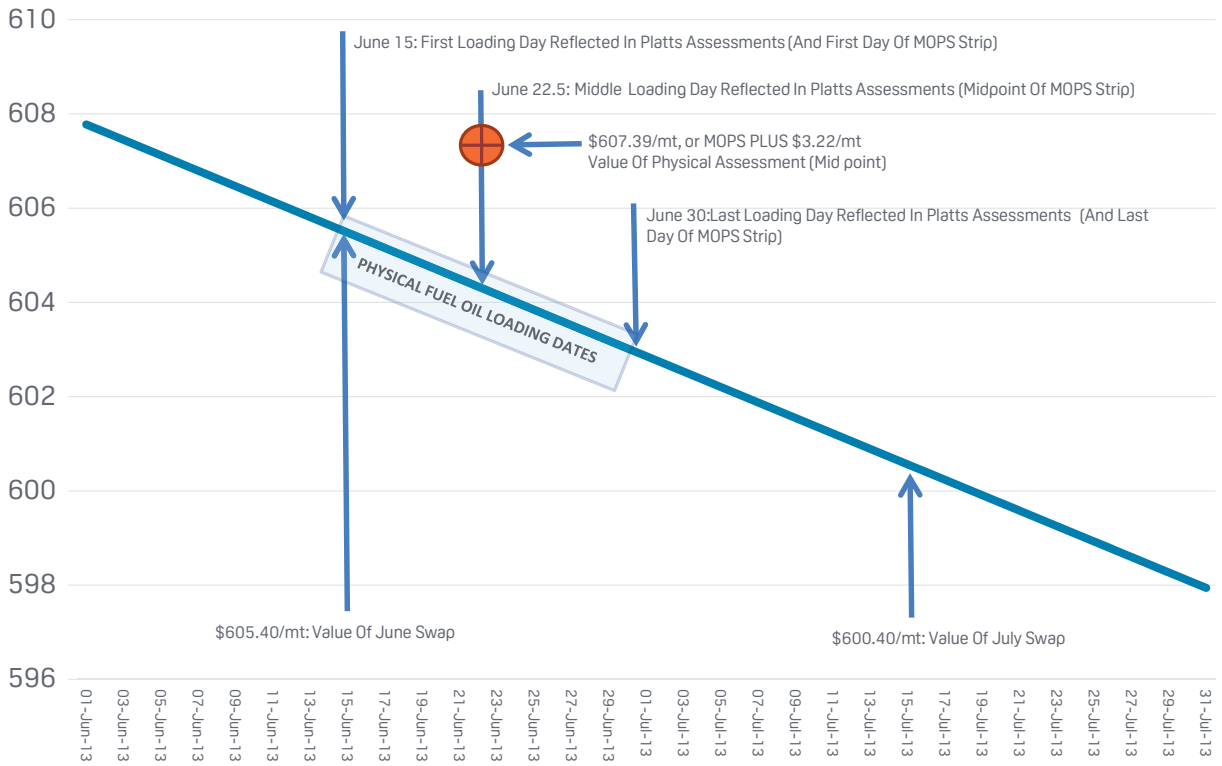
Cost differences between Singapore and Malaysia: Nominations for loading out of a terminal in Malaysia should not cause undue financial harm to a buyer, relative to receiving a nomination out of a Singapore terminal. Any demonstrable incremental costs incurred by the buyer from a Malaysian terminal nomination, including cabotage for onward deliveries into Malaysia itself, should be costs borne by the seller in the MOC process.

Reviews of MOC terminals and trade data: It is critical for Platts to monitor the quality of the information submitted by companies wishing to participate in the Platts MOC processes, including any infrastructure that will form part of the execution of that information.

Platts routinely, and as part of standard editorial practice, reviews the infrastructure reflected in its price assessment processes. These reviews ensure the suitability of data and information that are used to formulate Platts' end-of-day price assessments.

These reviews are conducted on a regular basis, and may take into consideration an array of issues including, but not limited to, operational and logistical issues, as well as counterparty acceptance.

ILLUSTRATION OF THE MOPS STRIP



The reviews are not designed to impede a company's ability to bilaterally engage in market transactions; the objective at all times is to ensure the integrity of published price assessments. Platts does not disclose the nature or scope of such routine reviews.

Explanation of the MOPS Strip

This explanation for the MOPS Strip describes how it is determined, and its application in Platts' assessment process.

The Platts assessment process determines the value of physical commodities 15-30 days forward for many oil products loading in Singapore. Many of these commodities trade on an outright price basis – where the full price is known at time of trade -- or on a Platts-related, floating price basis – where much of the value is determined in reference to reference prices that will be published in the future.

When the value of the commodity is clearly defined through

outright price bid, offer or trade, such activity can help establish value with a high degree of certainty. When there is a lack of outright price activity in a market, or when the most clearly defined market activity is being demonstrated on a floating price basis, it becomes critical to track the value the market assigns to future, yet-to-be published Platts assessments.

"MOPS" is an acronym that stands for the "Mean of Platts Singapore," and typically refers to any contract mechanism that derives its value by referencing the average of a set of Singapore-based oil price assessments to be published by Platts in the future – over a week, a month, or any agreed period of time. In derivatives markets, a "strip" is any contiguous date series in the future. A "Summer Strip" might be April, May, June, July, August and September. An "Annual Strip" would typically be 12 consecutive months.

A "MOPS Strip" is the sequence of 16 days that represent the future loading dates reflected in Platts' Singapore oil product assessments.

The MOPS Strip published by Platts for certain oil markets represents the value the market assigns to future Platts assessments, through trading in MOPS-related, monthly derivatives. This value is determined by analyzing the -derivatives market.

A derivative is a financially settled contract. Sometimes referred to as "paper", a derivative is a fixed price transaction, where the buyer is paid (or pays) the difference between the agreed strike price in the contract, and the actual average value of an underlying reference benchmark price. As an example, MOPS-related December "Singapore 180CST fuel oil derivative" settle their value from the average of assessments for the value of 180 CST fuel oil FOB Singapore, as published by Platts over the month of December.

As financially settled contracts, derivatives derive their value from published benchmark assessments. They do not entail physical delivery of oil. For example, if a 1,000 mt June derivative was bought at $605/mt, the seller would pay the buyer $10/mt (or $10,000 in this example) if the underlying benchmark averaged $615/mt over the month of June; the buyer would pay the seller $10/mt (or $10,000 in this example) if the reference price averaged $595/mt. Derivatives, commonly used to hedge exposure to benchmark prices in the future, are generally traded for full months, and also the balance of the prevailing month.

The final financial settlement of a derivative can only be completed when all the value that comprise the average are known (ie, after the last publishing day in June, for a swap that references the average of published prices in June).

Just like derivatives, Platts-related physical cargoes that trade on a floating price basis ultimately derive a final value over a pre-determined period of time in the future – usually around loading dates, with a premium or discount applied to reflect market structure, and possible differences in specification, location and trading terms.

The MOPS Strip is used as a component in measuring the value of the physical market, when floating price trading is common. The strip represents an underlying, market-assigned future value for the Platts assessments, and it is an important component in fully analyzing the price determination of physical cargoes when they are regularly traded on a floating price basis. While the value that Platts will publish in its assessments can never be known at the time of trading a cargo that will be delivered and priced in the future, a hedgeable, proxy value for the relevant Platts assessments of the future can be extrapolated from derivatives markets, so long as the derivatives analyzed, and the floating price physical contract being valued, use the same Platts reference price for final settlement.

Platts therefore publishes a MOPS Strip in markets where physical cargoes trade at both fixed price levels, and as premiums or discounts to the Platts assessment itself. It is published when there is a vibrant swaps market to serve as the basis for analysis. In Singapore, Platts publishes a MOPS Strip value for gasoline, jet fuel, naphtha, gasoil and fuel oil. There is no MOPS Strip calculated for products where derivatives are not assessed by Platts.

By standing as a hedgeable proxy value for the MOPS element of a floating price cargo, the MOPS Strip is essential to defining the flat price equivalent value of a cargo that is traded as a premium or discount to the Platts assessment. The MOPS Strip defines the value of "MOPS" in the assessment formula: "physical value = MOPS plus premium (or discount)."

To fully understand the application of the MOPS Strip, it is important to note that Platts' physical price assessments for most Singapore cargoes are based on cargoes loading 15-30 days forward from the date of the price assessment itself. Hence, if today is May 31, the assessments will reflect the value of cargoes loading during June 15-30.

MOPS Strip is the value of the Singapore derivatives market, effective for the mid-point date of the physical assessment. In this particular example, the mid-point of the assessed period is notionally June 22.5. This is a specific sample calculation for how the MOPS strip would be calculated:

180 CST high sulfur fuel oil on May 31, 2013 ($/mt)

June (paper): $605.40

July (paper):$600.40

June/July spread: +$5.00 (backwardation)

Physical FOB Singapore 180 CST (loading on June 15-30): $607.39

Since there are 30.5 days between mid-June (30 days) and mid-July (31 days) – we calculate the daily backwardation value to be +0.1639 (from 5.00/30.5). Since there are seven and a half days

between mid-June (June 15) and the mid-point date for physical assessment (June 22.5), the calculated MOPS strip value is:

= $605.40 + (0.1639 x -7.5)

= $604.17

In terms of the application of MOPS Strip in the Platts assessment process: the MOPS Strip provides the third leg when triangulating the physical value of the market using the formula "physical value = MOPS plus premium (or discount)." The MOPS Strip defines the value of "MOPS" in this equation. Again, this MOPS value is what the market has determined the future, yet to be published Platts assessments are able to be hedged at in the derivatives marketplace.

In an example, the difference between the physical value arrived at by the close of the assessment process and the MOPS Strip yields either a positive value or a negative value. This is the 'premium' or the 'discount' at which the physical market is trading versus future Platts assessments. In this case:

Physical premium (or discount) = Physical assessment - MOPS strip

Physical premium (or discount) = $607.39 – $604.17

Physical premium (or discount) = $3.22

In a second example, the reverse process also generates a value. If Platts assessed the physical market premium as being MOPS plus $3.22, the following equation could be applied:

Physical assessment = MOPS plus premium (or discount)

Physical assessment = $604.17 + $3.22

Physical assessment = $607.39

MOPAG Strip: Platts publishes assessments for Mean of Platts Arab Gulf or MOPAG Strip for 95 RON gasoline, gasoil, jet fuel and 380 CST fuel oil. The MOPAG Strip value is derived from MOPAG swaps using the same broad methodology as shown above for the MOPS strip calculations – although the two strips reflect derivatives values over different periods. The MOPAG swaps settle on Platts MOPAG netback assessments that reflect cargoes loading 20-40 days from the day of publication. Hence the MOPAG Strip represents the derivative value 20-40 days forward. Platts uses Balance Month and Month 1 swaps to calculate the MOPAG Strip value until the 10th calendar day of the month, following which Month 1 and Month 2 swaps are used to calculate the strip.

LPG

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Propane Refrigerated CFR Japan 30-45 days	AAVAK00	AAVAK03			CFR	Japan	30-45 days	11,000	44,000	US$	Metric Tons	
Propane Refrigerated CFR Japan 45-60 days	AAVAL00	AAVAL03			CFR	Japan	45-60 days	11,000	44,000	US$	Metric Tons	
Propane Refrigerated CFR Japan 60-75 days	AAVAM00	AAVAM03			CFR	Japan	60-75 days	11,000	44,000	US$	Metric Tons	
Propane Refrigerated CFR Japan 30-60 days cargo	PMAAV00	AAAVR00			CFR	Japan	30-60 days	11,000	44,000	US$	Metric Tons	
Propane CFR Japan 30-60 days vs Saudi Propane CP strip 20-40 days	PMAAX00	PMUEI03			CFR	Japan	30-60 days	11,000	44,000	US$	Metric Tons	
Propane CFR Korea 30-60 days vs Saudi Propane CP strip 20-40 days	PMABK00	PMABK03			CFR	South Korea	30-60 days	11,000	44,000	US$	Metric Tons	
Propane Refrigerated CFR South China 20-35 days cargo	AABAK00	AABAM00			CFR	China	20-35 days	11,000	44,000	US$	Metric Tons	
Propane CFR South China 20-35 days vs Saudi Propane CP strip 5-15 days	AABAI00	AABAI03			CFR	China	20-35 days	11,000	44,000	US$	Metric Tons	
Propane Refrigerated CFR Taiwan 20-35 days cargo	AABAN00	AABAQ00			CFR	Taiwan	20-35 days	11,000	44,000	US$	Metric Tons	
Propane CFR Taiwan 20-35 days vs Saudi Propane CP strip 5-15 days	AABAO00	AABAO03			CFR	Taiwan	20-35 days	11,000	44,000	US$	Metric Tons	
Propane Refrigerated CFR North Asia Zone 30-60 days cargo	AAJTQ00	AAJTR00			CFR	Japan/Korea/China/Taiwan	30-60 days	11,000	44,000	US$	Metric Tons	
Propane FOB AG 20-40 days cargo	PMUDM00	PMUDN03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Propane FOB AG 20-40 days cargo Month to Date	PMUDO00	PMUDP03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Propane FOB AG 20-40 days cargo vs Propane Saudi CP strip 20-40 days	PMABF00	PMUEJ03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Propane FOB AG cargo vs Saudi Propane CP M1	AAKZA00	AAKZA03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Propane Saudi CP strip 20-40 days AG loading to Japan-Korea	AAKZC00	AAKZC03								US$	Metric Tons	
Propane Saudi CP strip 5-15 days AG loading to China-Taiwan	AAKZE00	AAKZE03								US$	Metric Tons	
Propane FOB Saudi Arabia CP	PTAAM10				FOB	Saudi Arabia				US$	Metric Tons	
Butane Refrigerated CFR Japan 30-45 days	AAVAN00	AAVAN03			CFR	Japan	30-45 days	11,000	44,000	US$	Metric Tons	
Butane Refrigerated CFR Japan 45-60 days	AAVAO00	AAVAO03			CFR	Japan	45-60 days	11,000	44,000	US$	Metric Tons	
Butane Refrigerated CFR Japan 60-75 days	AAVAP00	AAVAP03			CFR	Japan	60-75 days	11,000	44,000	US$	Metric Tons	
Butane Refrigerated CFR Japan 30-60 days cargo	PMAAF00	AAAVQ00			CFR	Japan	30-60 days	11,000	44,000	US$	Metric Tons	
Butane CFR Japan 30-60 days vs Saudi Butane CP strip 5-15 days	PMAAH00	PMUEL03			CFR	Japan	30-60 days	11,000	44,000	US$	Metric Tons	
Butane CFR Korea 30-60 days vs Saudi Butane CP strip 20-40 days	PMABL00	PMABL03			CFR	South Korea	30-60 days	11,000	44,000	US$	Metric Tons	
Butane Refrigerated CFR South China 20-35 days cargo	AABAU00	AABAS00			CFR	China	20-35 days	11,000	44,000	US$	Metric Tons	
Butane CFR South China 20-35 days vs Saudi Butane CP strip 5-15 days	AABAT00	AABAT03			CFR	China	20-35 days	11,000	44,000	US$	Metric Tons	
Butane Refrigerated CFR Taiwan 20-35 days cargo	AABBH00	AABBK00			CFR	Taiwan	20-35 days	11,000	44,000	US$	Metric Tons	
Butane CFR Taiwan 20-35 days vs Saudi Butane CP strip 5-15 days	AABBI00	AABBJ00			CFR	Taiwan	20-35 days	11,000	44,000	US$	Metric Tons	
Butane Refrigerated CFR North Asia Zone 30-60 days cargo	AAJTT00	AAJTU00			CFR	Japan/Korea/China/Taiwan	30-60 days	11,000	44,000	US$	Metric Tons	
Butane FOB AG 20-40 days cargo	PMUDR00	PMUDS03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Butane FOB AG 20-40 days cargo Month to Date	PMUDQ00	PMUDT03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Butane FOB AG 20-40 days cargo vs Butane Saudi CP strip 20-40 days	PMABG00	PMUEK03				Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	

LPG

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Butane FOB AG cargo vs Saudi Butane CP Mo01	AAKZB00	AAKZB03			FOB	Arab Gulf	20-40 days	11,000	44,000	US$	Metric Tons	
Butane Saudi CP strip 20-40 days AG loading to Japan-Korea	AAKZD00	AAKZD03								US$	Metric Tons	
Butane Saudi CP strip 5-15 days AG loading to China-Taiwan	AAKZF00	AAKZF03								US$	Metric Tons	
Butane FOB Saudi Arabia CP	PTAAF10				FOB	Saudi Arabia				US$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 30-45 days	AASGO00	AASGO03			CFR	Singapore/Japan	30-45 days	22,000	44,000	US$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 45-60 days	AASGP00	AASGP03			CFR	Singapore/Japan	45-60 days	22,000	44,000	US$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 60-75 days	AASGQ00	AASGQ03			CFR	Singapore/Japan	60-75 days	22,000	44,000	US$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 30-60 days cargo	AASGN00	AASGN03			CFR	Singapore/Japan	30-60 days	22,000	44,000	US$	Metric Tons	
LPG Pressurized CFR Philippines 7-15 days	AAWUX00	AAWUX03			CFR	Philippines	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized CFR Philippines vs Saudi Propane-Butane CP Mo01	AAWUY00	AAWUY03			CFR	Philippines	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized CFR Vietnam 7-15 days	AAWUV00	AAWUV03			CFR	Vietnam	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized CFR Vietnam vs Saudi Propane-Butane CP Mo01	AAWUW00	AAWUW03			CFR	Vietnam	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized FOB East China 7-15 days	AAWUZ00	AAWUZ03			FOB	China	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized FOB East China vs Saudi Propane-Butane CP Mo01	AAWVA00	AAWVA03			FOB	China	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized FOB Singapore 7-15 days	AAWVD00	AAWVD03			FOB	Singapore	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized FOB Singapore vs Saudi Propane-Butane CP Mo01	AAWVE00	AAWVE03			FOB	Singapore	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized FOB South China 7-15 days	AAWVB00	AAWVB03			FOB	China	7-15 days	1,800	2,500	US$	Metric Tons	
LPG Pressurized FOB South China vs Saudi Propane-Butane CP Mo01	AAWVC00	AAWVC03			FOB	China	7-15 days	1,800	2,500	US$	Metric Tons	

LPG

Platts assesses the value of large cargoes of propane and butane supplied on refrigerated tankers in both the Middle East and the Asia Pacific regions. Additionally, Platts publishes assessments for the small-cargo LPG market in the Asia Pacific, reflecting the value of mixed LPG cargoes carried in pressurized ships.

Platts considers outright prices and floating prices in its assessments. Floating price transactions are most commonly based on a premium or discount to Saudi Aramco's monthly export Contract Prices (CPs) for propane and butane.

Platts Asia and Middle East propane assessments reflect specifications that conform to typical specifications issued by Saudi Aramco, including: minimum 95% propane content, maximum 4% butane content and maximum 0.1% olefin content. Butane specifications reflected in Platts assessments conform to typical specifications issued by Saudi Aramco, including: maximum 2% propane content, maximum 29% isobutane content, minimum 68% normal butane content and maximum 0.1% olefin content.

Platts assessments reflect standard terms and conditions for FOB spot transactions lifting from the Arab Gulf and CFR spot transactions into Japan, South Korea, South China and Taiwan main ports (see locations in table). Cost and freight are typically defined by Incoterms. Platts' assessments reflect transactions based on letter of credit as needed with typically 30-day terms.

Refrigerated LPG: In the refrigerated LPG markets, propane and butane are typically supplied on Very Large Gas Carriers (VLGCs), which are typically 44,000 mt, and commonly segregated into four tanks of 11,000 mt each on each ship. Each tank will typically contain either propane or butane. Platts refrigerated assessments reflect the value of refrigerated propane and refrigerated butane as stand-alone, minimum 11,000 mt trade sizes. Multiples of 11,000 mt, up to 44,000 mt, are considered for assessment and normalized for size as needed. Additionally, Platts also assesses the value of combination refrigerated cargoes where propane and butane are both committed for

delivery, typically in evenly split, 22,000 mt cargo sizes.

In Asia's delivered markets, Platts assesses cargoes for delivery in three half-month cycles. The cycles generally fall 30-45 days forward, 45-60 days forward and 60-75 days forward on the first day of every roll. Assessments roll forward on the first business day of a new month, and the first business day after the 15th of every month. As an example, from April 1 until April 15, Platts assessments would be for H1 May, H2 May and H1 June. On April 16 (or the first publishing day after the 15th), assessment cycles move forward by a half month to become H2 May, H1 June and H2 June. Platts' headline cargo assessment is produced by averaging the first two half-month assessments.

In the Middle East spot LPG market, Platts assesses the outright value of spot cargoes for loading on a FOB basis, 20-40 days after the date of assessment. Platts also publishes an assessment of the premium or discount for spot cargoes loading 20-40 days forward in the Middle East, and spot premiums for cargoes loading one month forward. These premiums and discounts reflect the value to be applied to the prevailing Saudi Aramco CP during dates of loading.

FOB AG: Export terminals including Ras Tanura and Yanbu in Saudi Arabia, and any safe port in Qatar

CFR Singapore-Japan: Platts' 11:11 refrigerated LPG cargo assessments reflect the value of cargoes delivered to main ports from Singapore to Japan.

CFR Japan: Import terminals at main ports including Kashima, Yokkaichi and Oita

CFR Korea: Import terminals at main ports including Yeosu and Ulsan

CFR South China/Taiwan: Import terminals, and floating storage vessels off China main ports including Shenzhen, Zhuhai, Shantou, Mailiao and Kaohsiung

CFR North Asia: Average value of CFR Japan and CFR South China assessments

Pressurized LPG: In the pressurized markets, Platts assesses the values of mixed LPG cargoes in Asia, reflecting a typical mix of 30% propane, 70% butane.

Platts assessments reflect the value of mixed, pressurized LPG cargoes for delivery CFR Vietnam (basis CFR Ho Chi Minh City) and CFR Philippines (basis CFR Bataan). Platts also assesses the value of such cargoes loading from East China (basis FOB Shanghai); South China (basis FOB Shenzhen) and FOB Singapore. These pressurized cargo assessments reflect the value of parcels to be delivered 7-15 days forward from the date of publication. These values are published as outright price assessments. Platts also publishes an assessment for the premium or discount for cargoes relative to the Saudi Aramco CP that prevails at the time the cargo is delivered or loaded.

Asia Strip: Platts publishes two strip values for the Saudi CP, based on the official CP for the current month and forward CP values derived from the swaps market. These values provide a marker for the value of CP relative to the CFR delivery dates for Japan/Korea and China/Taiwan.

CFR Vietnam: Pressurized LPG storage terminals in Vietnam, normalized to Ho Chi Minh City

CFR Philippines: Pressurized LPG storage terminals in the Philippines, normalized to Bataan

FOB East China: Pressurized LPG storage terminals in East China, normalized to Shanghai

FOB South China: Pressurized LPG storage terminals in South China, normalized to Shenzhen

FOB Singapore: Pressurized LPG storage terminals in Singapore

GASOLINE

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Gasoline Unl 90 FOB South China	AAICU00	AAICV00			FOB	China	15-30 days	25,000	30,000	US$	Metric Tons	8.5
Gasoline Unl 91-92 C+F Japan Cargo	PGACW00	PGACW03			C+F	Japan		50,000	150,000	US$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo	PGAEY00	PGAEY03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 92 MOPS strip	AAXEQ00	AAXEQ03				Singapore				US$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo vs Gasoline Unl 92 MOPS strip	AAXER00	AAXER03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo vs Naphtha MOPS strip	AAPKG00	AAPKG03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo $/mt	AAXNA00	AAXNA03			FOB	Singapore	15-30 days	5,000	20,000	US$	Metric Tons	8.5
Gasoline Unl 92 (500 ppm) FOB Spore Cargo Cash Diff	PGAFY00	PGAFY03			FOB	Singapore	15-30 days	100,000	200,000	US$	Barrels	8.5
Gasoline 92 RON Unl MOP West India $/b	AARBP00	AARBP03			FOB	India		50,000	150,000	US$	Barrels	8.5
Gasoline 92 RON Unl MOP West India $/mt	AARBQ00	AARBQ03			FOB	India		5,000	20,000	US$	Metric Tons	8.5
Gasoline Unl 92 C+F Australia Cargo	AACZF00	AACZB00			C+F	Australia		50,000	150,000	US$	Barrels	8.5
Gasoline Unl 93 FOB South China	AAICW00	AAICX00			FOB	China	15-30 days	25,000	30,000	US$	Metric Tons	8.5
Gasoline Unl 95 FOB Spore Cargo	PGAEZ00	PGAEZ03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 95 FOB Spore Cargo vs Naphtha MOPS strip	AAPKF00	AAPKF03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 95 FOB Spore Cargo vs Gasoline Unl 95 MOPS strip	AGUMA00	AGUMA03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 95 MOPS strip	AGUMS00	AGUMS03				Singapore				US$	Barrels	8.5
Gasoline 95 RON Unl MOP West India $/b	AAQWH00	AAQWH03			FOB	India		50,000	150,000	US$	Barrels	8.5
Gasoline 95 RON Unl MOP West India $/mt	AAQWI00	AAQWI03			FOB	India		5,000	20,000	US$	Metric Tons	8.5
Gasoline Unl 95 C+F Australia Cargo	AACZH00	AACZG00			C+F	Australia		50,000	150,000	US$	Barrels	8.5
Gasoline Unl 95 C+F Japan Cargo	PGAQQ00	PGAQR03			C+F	Japan		50,000	150,000	US$	Barrels	8.5
Gasoline Unl 95 FOB Korea Cargo	PGAQO00	PGAQP03			FOB	South Korea	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline 92 RON Unl FOB Arab Gulf Cargo	AAGJA00	AAGJA03			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	8.5
Gasoline 92 RON Unl FOB Arab Gulf vs MOPAG Gasoline	AAGZA00	AAGZA03			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	8.5
Gasoline 95 RON Unl CFR Arab Gulf vs MOPAG Gasoline	AAWUK00	AAWUK03			CFR	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	8.5
Gasoline 95 RON Unl FOB Arab Gulf Cargo	AAICY00	AAICZ00			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	8.5
Gasoline 95 RON Unl FOB Arab Gulf vs MOPAG Gasoline	AAWUJ00	AAWUJ03			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	8.5
Gasoline 95 RON FOB Fujairah Cargo	AFUJA00	AFUJA03			FOB	Fujairah	20-40 days	200,000	300,000	US$	Barrels	8.5
Gasoline 95 RON MOPAG Strip	AFUJB00	AFUJB03				Arab Gulf				US$	Barrels	8.5
Gasoline Unl 97 FOB Spore Cargo	PGAMS00	PGAMS03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 97 FOB Spore Cargo vs Naphtha MOPS strip	AAPKE00	AAPKE03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 91 Non-oxy FOB Spore Cargo $/b	AAYNA00	AAYNA03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline Unl 91 Non-oxy FOB Spore Cargo vs MOPS Gasoline 92 Strip $/b	AAYNB00	AAYNB03			FOB	Singapore	15-30 days	50,000	150,000	US$	Barrels	8.5
Gasoline 95 RON CFR South Africa Cargo	AAQWW00	AAQWW03			C+F	South Africa	20-40 days	200,000	300,000	US$	Barrels	8.5

Gasoline

Singapore gasoline assessments: Platts FOB Singapore assessments reflect "FOB Straits" bids, offers and transactions. For FOB Straits transactions, sellers are required to nominate loading from one of the locations in Singapore and Malaysia that are approved for the Platts Market on Close assessment process as a delivery point.

Platts FOB Singapore gasoline assessments reflect standard industry specifications, which are summarized in the table in this section. The specifications listed are not comprehensive on all possible specification elements, and cargoes reflected in the Platts assessment processes must at all times be deemed to fall within industry standards, including merchantability of the product. Grades which are not widely merchantable -- for instance, gasoline with unusual additives, including MMT and secondary butyl acetate or unusually high quantities of certain additives or blendstocks which are not typical -- will not be reflected in the assessments. Platts is currently considering any addition of SBAC above trace as deeming the gasoline atypical.

FOB AG GASOLINE SPECIFICATIONS

Property	Standard
Research Octane Number	Min 92, Min 95
Motor Octane Number	Min 82, Min 85
Appearance	Clear
Color	Undyed
Corrosion, Copper Strip (3 Hrs at 50°C)	Max 1
Density at 15°C kg/cu m	0.72-0.78
Distillation	
10% vol recovered at (°C)	Max 65
50% vol recovered at (°C)	Min 80, Max 120
90% vol recovered at (°C)	Max 180
End point (°C)	Max 210
Residue, vol%	Max 2
Doctor Test	Negative
Gum, Existent (mg/100 ml)	Max 4
Induction Period (minutes)	Min 480
Lead Content, gPb/l	Max 0.013
Reid Vapor Pressure at 37.8° C (psi)	Max 9
Sulfur, wt %	Max 0.01
Allowed oxygenates/MTBE (If added)	Max 15 (of which maximum MTBE content of 10.0)
Alcohol	No additions of any alcohol
Aromatics, vol %	Max 35
Benzene, vol %	Max 1
Olefins, vol %	Max 18
Odor	Marketable
Additives	No metal additives; no metal octane boosters

Transactions, bids and offers of a minimum of 50,000 barrels are considered for assessment. The maximum cargo size for any one bid or offer is 150,000 barrels. These assessments reflect gasoline for loading 15 to 30 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of providing a bid or offer for publication in the Platts assessment process.

On July 1, 2019, Platts amended the FOB Singapore gasoline specifications to reflect Reid Vapor Pressure at a maximum of 9.0 PSI, from the previous 9.5 PSI. Platts also reduced the final boiling point to a maximum of 215 degrees Celsius from a maximum of 225 degrees Celsius, and lowered the maximum sulfur content of all three gasoline grades to 50 ppm (0.005%), from 350 ppm (0.035%) previously. In addition, because of the reduction of the sulfur content to a maximum of 50 ppm, the maximum aromatics content is set at maximum 40%, while a maximum olefins content is set at 25%.

At the same time, Platts launched a FOB Singapore high sulfur 92 RON gasoline cash differential assessment (price database code PGAFY00), and monthly average FOB Singapore high sulfur 92 RON gasoline cash differential (price database code PGAFY03). The new assessment reflects cargo sizes of 100,000 to 200,000 barrels for loading from any of the approved Platts FOB Straits terminals 15-30 days ahead of the date of publication. Platts publishes the assessment as a differential against the FOB Singapore 92 RON gasoline MOPS Strip. The new assessment reflects Indonesian 92 RON gasoline specification with specific gravity between 0.715 g/ml and 0.770 g/ml and with a maximum sulfur content of 500 ppm.

On September 2, 2019, Platts launched a new FOB Singapore 95 RON gasoline cash differential assessment (price database code AGUMA00), and monthly average FOB Singapore 95 RON gasoline cash differential assessment (price database code AGUMA03). The new assessment reflects cargo sizes of 50,000 to 150,000 barrels for loading from any of the approved Platts FOB Straits terminals 15-30 days ahead of the date of publication. Platts also launched a new FOB Singapore 95 RON gasoline MOPS Strip (price database code AGUMS00), and monthly average FOB Singapore 95 RON gasoline MOPS Strip (price database code AGUMS03).

FOB SINGAPORE GASOLINE SPECIFICATIONS

Property	Standard
Research Octane Number (RON)	Min 92, Min 95, Min 97
Lead content, gPb/l	Max 0.013
Density@15°C, g/ml	Min 0.72
Reid Vapor Pressure (psi)	Max 9.0
Distillation, degrees Celsius	
Initial Boiling Point	Report
10% evaporated	Max 74
50% evaporated	Min 80, Max 127
90% evaporated	Max 190
Final Boiling Point	Max 215
Residue, % vol	Max 2.0
Loss, % vol	2
Odor	Marketable
Existent gum, mg/100 ml	Max 4
Benzene content, % vol	Max 2.5
Sulfur, % wt	Max 0.005
Doctor Test	Negative
Mercaptan sulfur, % wt	Max 0.0015
or Mercaptan sulfur, ppm	Max 15
Copper corrosion (3 hours at 50°C)	Max 1
Induction period, minutes	Min 240
Oxygenates content, % vol	Max 14.0 (of which maximum MTBE content of 10.0)
Aromatics, % vol,	40
Olefins, % vol,	25
Color	Undyed, Light Yellow
Alcohol	No additions of any alcohol
Metallic Additives	None added
Acetone	Max 100 ppm

China gasoline assessments: Platts gasoline assessments reflect cargoes for loading on FOB South China basis. Assessments reflect 25,000-30,000 mt cargoes. This market typically trades at a differential to Singapore 92 RON unleaded assessments. Platts' China assessments are expressed in US$/mt, using a conversion factor of 8.5.

South Korea gasoline assessments: Platts assesses 95 RON unleaded FOB Korea. This market typically trades on a naphtha related basis.

Japan gasoline assessments: Platts 91-92 RON unleaded gasoline, for delivery on a C+F Chiba basis, is assessed as a netforward into Japan, using the FOB Singapore 92 RON unleaded gasoline as a base. A freight rate for 30,000 mt tankers is used. The freight value is divided by 8.5 and added to the Singapore base assessment.

Platts 95 RON unleaded C+F Chiba assessment is determined by assessing the gasoline market delivered into the Chiba region in Japan.

Australia gasoline assessments: Platts assesses Australian 92 and 95 RON unleaded on a C+F Melbourne/Sydney basis. These assessments are determined on a netforward basis from FOB Singapore 92 and 95 RON unleaded assessments using a freight rate for 35,000 mt tankers. Freight rates are published daily in Platts Clean Tankerwire. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated. Effective January 2, 2019, Platts uses the Singapore-Australia 35kt clean MR freight assessments to calculate the CFR Australia prices from the previous Singapore-Australia 30kt clean MR freight in its CFR Australia assessments.

India gasoline assessments: The Mean of Platts West India Netbacks (MOPWIN) assessment for 92 and 95 RON gasoline are derived by deducting freight costs from the assessments for the same products in Singapore. Although West India has a surplus of oil products for export, there remains only a sporadic flow of spot cargoes and insufficient local price formation to support independent spot prices on FOB West India basis. Platts therefore launched direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India-Singapore clean freight assessments used for generating the netback values can be found on Platts Global Alert.

Middle East gasoline assessments: Platts' benchmark gasoline netback assessment is for 92 RON and 95 RON unleaded gasoline on a FOB Arab Gulf basis. These assessments are determined on a netback basis from FOB Singapore 92 RON and 95 RON unleaded assessments using a freight rate for 35,000 mt tankers. Freight rates are published daily in Platts Clean Tankerwire. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated.

Middle East gasoline assessments (differentials): Platts assesses spot premiums for FOB and CFR gasoline cargoes. These assessments, which are published as a spot market premium/discount to Platts' existing 95 RON Middle East netback assessment, reflect the value of 95 RON gasoline cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of publication. Platts considers bids, offers, transactions, and reports of transactions when assessing this spot market differential. Platts also assesses a spot differential for FOB cargoes to its 92 RON Middle East netback assessment. This reflects the value of 92 RON gasoline cargoes typically 200,000 to 300,000 barrels each, for loading 20 to 40 days forward from the date of publication.

Cargoes loading from the following Gulf ports are considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Sitra, Fujairah, Ras Laffan and any safe and sound port within this geographic area. The assessments would be normalized to loadings in Fujairah for all products and in Bandar Abbas for Gasoline 95 CFR.

FOB Fujairah gasoline assessments (outright): The assessment reflects the value of 95 RON gasoline cargoes, typically 200,000 to 300,000 barrels each, for loading 20 to 40 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Middle East 95 RON gasoline spot differentials (premium/discount) and the MOPAG 95 RON gasoline strip. The MOPAG Strip is calculated using 95 RON gasoline derivatives that settle on Platts Middle East 95 RON gasoline netback assessments.

FOB SINGAPORE 91 RON NON OXY SPECIFICATIONS

Property	Standard
Research Octane Number (RON)	Min 91
Motor Octane Number (MON)	Min 81
Lead content, gPb/l	Max 0.013
Density@15°C, g/ml	Report
Reid Vapor Pressure (psi)	Max 9
Distillation, degrees Celsius	
Initial Boiling Point	Report
10% evaporated	Max 65
50% evaporated	Min 74, Max 115
90% evaporated	Max 183
Final Boiling Point	Max 215
Residue, % vol	Max 2.0
Loss, % vol	2
Odor	Marketable
Existent gum, mg/100ml	Max 4
Benzene content, % vol	Max 1
Sulfur, % wt	Max 0.015
Doctor Test	Negative
Mercaptan sulfur, % wt	Max 0.0015
or Mercaptan sulfur, ppm	Max 15
Copper corrosion (3 hours at 50°C)	Max 1
Induction period, minutes	Min 360
Oxygenates as components, % vol	Nil
Oxygenates as contaminants, % vol	Max 1.0
Aromatics, % vol,	17-42
Olefin, % Vol,	Max 18
Color	Undyed
Alcohol	No addition of any alcohol
Metallic Additives	None added
Acetone	Max 100 ppm

Platts also publishes assessments for MOPAG 95 RON gasoline derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG 95 RON gasoline strip.

South Africa gasoline assessment: On August 1, 2018, Platts began publishing 95 RON gasoline assessments on CFR South Africa basis. The new assessment reflects cargoes of 200,000 to 300,000 barrels each,on a delivered basis to South Africa. Platts calculates the netforward 95 RON CFR South Africa assessment by applying the Platts daily assessment for AG-South Africa 35,000 mt clean tanker assessment to the FOB Fujairah 95 RON assessments.

NAPHTHA

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Naphtha C+F Japan Cargo 30-45 Days	PAAAE00	PAAAE03			C+F	Japan	30-45 days	25,000		US$	Metric Tons	9
Naphtha C+F Japan Cargo 45-60 Days	PAAAF00	PAAAF03			C+F	Japan	45-60 days	25,000		US$	Metric Tons	9
Naphtha C+F Japan Cargo 60-75 Days	PAAAG00	PAAAG03			C+F	Japan	60-75 days	25,000		US$	Metric Tons	9
Naphtha C+F Japan Cargo	PAAAD00	PAAAD03			C+F	Japan	45-75 days	25,000		US$	Metric Tons	9
Naphtha MOPJ strip C+F Japan	AAXFH00	AAXFH03				Japan				US$	Metric Tons	9
Naphtha C+F Japan vs Naphtha MOPJ strip	AAXFI00	AAXFI03			C+F	Japan	45-75 days	25,000		US$	Metric Tons	9
Naphtha C+F Japan Premium/Discount	PAADI00	PAADJ03			C+F	Japan	30-60 days	25,000		US$	Metric Tons	9
Naphtha C+F Korea Cargo	PAADE00	PAADF03			C+F	South Korea	30-60 days	25,000		US$	Metric Tons	9
Naphtha C+F Korea Cargo Premium/Discount	PAADG00	PAADH03			C+F	South Korea	30-60 days	25,000		US$	Metric Tons	9
Naphtha FOB Arab Gulf Cargo	PAAAA00	PAAAA03			FOB	Arab Gulf				US$	Metric Tons	9
Naphtha FOB Arab Gulf vs MOPAG Naphtha	AAPKH00	AAPKH03			FOB	Arab Gulf	20-40 days	25,000	75,000	US$	Metric Tons	9
Naphtha FOB Singapore Cargo	PAAAP00	PAAAP03			FOB	Singapore	15-30 days	100,000	250,000	US$	Barrels	9
Naphtha MOPS strip	AAPKA00	AAPKA03				Singapore				US$	Barrels	9
Naphtha CFR Singapore	AAOVF00	AAOVF03			CFR	Singapore	15-30 days	50,000	150,000	US$	Barrels	9
Naphtha CFR Singapore vs Naphtha MOPS strip	AAOVG00	AAOVG03			CFR	Singapore	15-30 days	50,000	150,000	US$	Barrels	9
Naphtha LR2 FOB Arab Gulf Cargo	AAIDA00	AAIDB00			FOB	Arab Gulf				US$	Metric Tons	9
Naphtha MOP West India $/b	AAQWJ00	AAQWJ03			FOB	India				US$	Barrels	9
Naphtha MOP West India $/mt	AAQWK00	AAQWK03			FOB	India				US$	Metric Tons	9

Naphtha

Japan naphtha: Platts assesses the value of naphtha for delivery on a C+F basis into Japan, reflecting three major half-month cycles, and an additional single "cargo" value reflecting two of these cycles. The three half-month cycles assessed are: 30-45 days forward; 45-60 days forward and 60-75 days forward. Assessments roll forward on the first business day of a new month, and the first business day after the 15th of every month. For example, over April 1-15, Platts assesses H2 May, H1 June and H2 June. These assessments would be rolled on the first business day after April 15 to H1 June, H2 June and H1 July.

The main cargo assessment for Japan (Mean of Platts Japan, or MOPJ) reflects the lows and the highs of the second and third published cycles. This maintains a consistency in the rollovers and sets the benchmark as a 45-75 day market.

Platts also assesses a spot premium or discount to reflect the value of cargoes delivered into Japan. The differential reflects the delivery of 25,000 mt cargoes in the first and second CFR Japan cycles, and is expressed as a differential against MOPJ.

Following industry feedback, S&P Global Platts began reflecting a maximum of 3 ppm carbon disulfide in its assessments for naphtha delivered to Japan for cargoes delivered in the second half of November 2017 onwards. The change was in-line with naphtha market changes in the region in the second half of 2017.

South Korea naphtha: Platts assesses the value of naphtha for delivery on a C+F basis into South Korea (Mean of Platts Korea, or MOPK) as a cash differential against MOPJ, and expressed as an outright price. Platts also assesses a spot premium or discount to reflect the value of cargoes delivered into South Korea. The differential reflects the delivery of 25,000 mt cargoes in the 30-60 days forward from the date of publication, and is expressed as a differential against MOPJ.

Platts amended the minimum paraffin level to 70%, from 65% previously, in its assessments of naphtha cargoes delivered to South Korea, effective October 2, 2017. In addition, Platts reflected a maximum of 3 ppm carbon disulfide in its assessments for naphtha cargoes delivered to South Korea.

Middle East naphtha: Platts' benchmark Middle Eastern assessments are established as a freight netback. The FOB Arab Gulf assessments (for both 55,000 mt (Naphtha) and 75,000 mt (Naphtha LR2), are assessed as freight netbacks from MOPJ. Platts uses its daily assessments of the freight market (published in the Platts Clean Tankerwire) to determine the netback. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated.

PLATTS CFR JAPAN NAPHTHA SPECS

Property	Standard
Paraffins	Min 65%
Specific gravity at 60°F	0.65-0.74 g/m
Reid Vapor Pressure	Max 13 psi
Sulfur	Max 650 ppm
Initial boiling point	Min +25°C
Final boiling point	Max 204°C
Chlorine content	Max 1 ppm
Mercury	Max 1 ppb
Arsenic	Max 20 ppb
Olefins	Max 1%
N-paraffins	Min 30%
Color	Min +20 Saybolt
Lead	Max 150 ppb
Oxygenates	Max 50 ppm TAME, MTBE and/or ETBE
Carbon Disulfide	Max 3 ppm

CFR SINGAPORE NAPHTHA SPECS

Property	Unit	Test Method	Specification
Density	kg/l	ASTM D4052	Min 0.660
Research Octane Number		ASTM D2700	Min 72.0
Total sulfur	wt. ppm	ASTM D5453	Max 250.0
Benzene content	% vol	ASTM D5580	Max 2.5
Distillation 50% evaporated	°C	ASTM D86	Min 50
Lead	wt ppb	ICP-MS	13 Max.
Arsenic	wt ppb	ICP-MS	20 Max
Initial Boiling Point	°C	ASTM D86	25 min
Final Boiling Point	°C	ASTM D86	204 Max
Mercury	wt ppb	UOP 938	Report
Paraffins	% vol	ASTM D6839	Report
Olefins	% vol	ASTM D6839	Report
Naphthenes	% vol	ASTM D6839	Report
Aromatics	% vol	ASTM D6839	Report
Oxygenated Compounds	% vol	ASTM D6839	0.2 max
Mercaptan sulfur	wt %	ASTM D3227	Max 0.001
Reid Vapor Pressure	psi	ASTM D6378	Max 13.0

Middle East naphtha (differentials): Platts assesses spot differentials for FOB Arab Gulf naphtha cargoes. These assessments, which are published as a spot market premium/discount to Platts' existing Middle East 55,000 mt naphtha netback assessment, reflect the value of naphtha cargoes, between 25,000 mt and 75,000 mt from the previous 25,000 mt each, for loading 20 to 40 days forward from the date of publication. Platts considers bids, offers, transactions, and reports of transactions when assessing this spot market differential. On January 7, 2015, Platts announced a series of changes to its Middle East products assessments, following a broad period of industry feedback and discussion. These changes included amending the laycan, volumes and locations reflected in the assessments.

On January 2, 2019, Platts amended the cargo size reflected in its Middle East naphtha spot cargo differential assessment to 25,000-75,000 mt from 25,000 mt.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Sitra, Fujairah, Ras Laffan and any safe and sound port within this geographic area.

PLATTS CFR SOUTH KOREA NAPHTHA SPECS

Property	Standard
Paraffins	Min 70%
Specific gravity at 60°F	0.65-0.74 g/m
Reid Vapor Pressure	Max 13 psi
Sulfur	Max 650 ppm
Initial boiling point	Min +25°C
Final boiling point	Max 204°C
Chlorine content	Max 1 ppm
Mercury	Max 1 ppb
Arsenic	Max 20 ppb
Olefins	Max 1%
N-paraffins	Min 30%
Color	Min +20 Saybolt
Lead	Max 150 ppb
Oxygenates	Max 50 ppm TAME, MTBE and/or ETBE
Carbon Disulfide	Max 3 ppm

India naphtha: The Mean of Platts West India Netback (MOPWIN) assessment for naphtha is derived by deducting freight costs from the assessments for the same product in Japan. Although West India has a surplus of oil products for export, there remains only a sporadic flow of spot cargoes and insufficient local price formation to support independent spot prices on FOB West India basis. Platts therefore launched direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India-Singapore clean freight assessments used for generating the netback values can be found in the Platts Clean Tankerwire.

Naphtha (Singapore): The benchmark FOB Singapore naphtha assessment is established using a freight netback from Japan. Platts converts the naphtha assessed in Japan in dollars per metric ton to dollars per barrel, using a conversion factor of 9. The calculation is as follows:

((First published cycle in Japan minus Singapore-Japan freight)/9) -$0.05/barrel

The assessed freight is for a MR vessel of 30,000 mt. Port charges, otherwise imposed in Japan, are deducted in the FOB Singapore naphtha assessment and are set at 5 cents/b.

Please also note that the implicit contango or backwardation between the cycles is also taken into account.

Platts FOB Singapore naphtha assessments are for 15-30 days from publication on a rolling basis.

Thus on April 20, Platts would be assessing May 5 through May 20.

In a typical example:

On April 15:

Price in Japan: 1,349.00-1,349.50 (H2 May)

Less freight: 30.000

FOB Singapore: 1,319.25

Barrel basis: 146.58

Less costs: 146.53 or 146.50-146.55

On the day of the rollover of the cycles in Japan, that is, on the 1st and the 16th of the month, the FOB Singapore assessment will absorb the backwardation or contango of the lapsed cycle in Japan for five days inclusive of Saturday and Sunday. For example, on April 16, the contango between H2 May and H1 June is $0.25/mt and assuming it remains constant throughout the five days. Platts factors in this contango on declining scale until April 20:

Day of month:	1st	2nd	3rd	4th	5th	6th onwards
Day of month:	16th	17th	18th	19th	20th	21st onwards
	100%	80%	60%	40%	20%	0

Spot CFR Singapore naphtha: This assessment reflects the growth of naphtha imports into Singapore, with a significant volume used for blending into gasoline. The assessment reflects cargoes delivering into any approved Platts FOB Straits terminal 15-30 days ahead of the date of publication and of parcel size in the range of 50,000 to 150,000 barrels. Platts publishes the assessment as both an outright value and as a differential against the FOB Singapore Naphtha MOPS Strip. Specifications can be found in the table.

CFR delivery standards: For CFR Singapore assessments, buyers should nominate terminal for delivery 10 days before the first day of delivery dates agreed at time of trade. The seller should narrow the five-day delivery range to a three-day delivery range seven days before the first day of the narrowed delivery range. Platts also expects the seller to nominate the performing vessel seven days before the first day of the narrowed delivery range.

CFR deviations: A CFR buyer has the right to request a deviation of the ship to another port, provided the shipowner has granted, or has the ability to grant, the deviation to the charterer. Any incremental expenses associated with the deviation are borne by the buyer as he/she is initiating the request for the deviation. Charges incurred because of the deviation must be transparent and be granted at cost and in line with normal market practices. Platts will monitor such charges if they result in anomalies.

JET FUEL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Jet Kero FOB Spore Cargo	PJABF00	PJABF03			FOB	Singapore	15-30 days	100,000	250,000	US$	Barrels	7.9
Jet Kero MOPS strip	AAPJZ00	AAPJZ03				Singapore				US$	Barrels	7.9
Jet Kero FOB Spore vs Jet Kero MOPS strip	PJACU00	AAFDB00			FOB	Singapore	15-30 days	100,000	250,000	US$	Barrels	7.9
Jet Kero MOP West India $/b	AAQWL00	AAQWL03			FOB	India		100,000	250,000	US$	Barrels	7.9
Jet Kero MOP West India $/mt	AAQWM00	AAQWM03			FOB	India		10,000	30,000	US$	Metric Tons	7.9
Jet Kero C+F Australia Cargo	AAFIY00	AAFIZ00			C+F	Australia		100,000	250,000	US$	Barrels	7.9
Jet Kero C+F Japan Cargo	PJAAN00	PJAAN03			C+F	Japan		100,000	250,000	US$	Barrels	7.9
Jet Kero C+F Japan Cargo vs Jet Kero MOPS strip	PAADK00	PAADL03			C+F	Japan		100,000	250,000	US$	Barrels	7.9
Jet Kero FOB Korea Cargo	PJADG00	PJADH03			FOB	South Korea	15-30 days	100,000	250,000	US$	Barrels	7.9
Jet Kero FOB Korea Cargo vs Jet Kero MOPS strip	PJADI00	PJADJ03			FOB	South Korea	15-30 days	100,000	250,000	US$	Barrels	7.9
Jet Kero C+F South China Cargo	PJABQ00	PJABQ03			C+F	China		25,000	45,000	US$	Metric Tons	7.9
Jet Kero C+F South China Cargo vs Jet Kero MOPS strip	AAWTW00	AAWTW03			C+F	China		200,000	400,000	US$	Barrels	7.9
Jet Kero FOB Arab Gulf Cargo	PJAAA00	PJAAA03			FOB	Arab Gulf				US$	Barrels	7.9
Jet Kero FOB Arab Gulf vs MOPAG Jet Kero	PJACV00	AAFDF00			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	7.9
Jet Kero LR2 FOB Arab Gulf Cargo	AAKNZ00	AAKOA00			FOB	Arab Gulf				US$	Barrels	7.9
Jet Kero FOB Fujairah Cargo	AFUJF00	AFUJF03			FOB	Fujairah	20-40 days	200,000	300,000	US$	Barrels	7.9
Jet Kero MOPAG Strip	AFUJG00	AFUJG03				Arab Gulf				US$	Barrels	7.9
Jet Kero CFR South Africa Cargo	AAQWT00	AAQWT03			C+F	South Africa	20-40 days	200,000	300,000	US$	Barrels	7.9

Jet fuel

All Platts Asia and Middle East jet fuel assessments reflect standard commercial Jet-A1 specifications, as defined by UK Ministry of Defence in DEFSTAN 91-091, unless otherwise stated.

Singapore jet fuel: Platts FOB Singapore assessments reflect "FOB Straits" bids, offers and transactions. For FOB Straits transactions, sellers are required to nominate loading from one of the locations in Singapore and Malaysia that are approved for the Platts Market on Close assessment process as a delivery point.

Specific gravity is typically 0.8 g/ml. Singapore smoke point is typically 19-21, and premiums may be paid for higher smoke point and discounts for lower smoke point. Color specification for FOB Straits cargoes reflects a minimum of 18 Saybolt color guarantee.

The Singapore physical assessment reflects transactions, bids and offers of a minimum of 100,000 barrels, maximum 250,000 barrels, loading 15-30 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication.

The FOB Singapore premium/discount assessment takes into account physical cargo activities 15 to 30 days forward from the date of publication.

Middle East jet fuel: FOB Arab Gulf is assessed as a netback from the benchmark FOB Singapore assessment using 55,000 mt and 80,000 mt (LR2) ship freight rates. Freight rates reported in the Platts Clean Tankerwire are used. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated.

Middle East jet fuel (differentials): Platts assesses spot differentials for FOB Arab Gulf jet fuel cargoes. These assessments, which are published as a spot market premium/discount to Platts' Middle East jet fuel netback assessment, reflect the value of jet fuel cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of transactions when assessing this local spot market differential.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, , Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Sitra, Fujairah, Ras Laffan and any safe and sound port within this geographic area.

FOB Fujairah jet fuel assessments (outright): Platts assesses outright values for jet fuel cargoes on FOB Fujairah basis. The

assessment reflects the value of jet fuel cargoes, typically 200,000 to 300,000 barrels each, for loading 20 to 40 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Middle East jet fuel spot differentials (premium/discount) and MOPAG jet fuel strip. The MOPAG strip is calculated using jet fuel derivatives that settle on Platts Middle East jet fuel netback assessments. Platts also publishes assessments for MOPAG jet fuel derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG jet fuel strip.

India jet fuel: The Mean of Platts West India Netback (MOPWIN) assessment for jet fuel is derived by deducting freight costs from the assessments for the same product in Singapore. These assessments are a direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India-Singapore clean freight assessments used for generating the netback values can be found in the Platts Clean Tankerwire.

Japan jet fuel: Jet fuel typically sold into Japan is around 20-21 Saybolt color. Platts surveys the market to determine the tradable levels for delivered MR vessels with the assessment made for C+F Chiba, Japan. Most cargoes trade on a Mean of Platts Singapore (MOPS) basis plus a differential.

South Korea jet fuel: Korea jet fuel is assessed on a FOB Korea basis, reflecting cargoes for loading 15-30 days forward from the date of publication. Most cargoes trade on a Mean of Platts Singapore (MOPS) basis plus a differential.

China jet fuel: China jet fuel is assessed on a C+F basis main ports including Qinhuangdao, Shanghai and Huangpu. Assessments reflect MR vessels ranging from 25,000 to 45,000 mt. Cargoes reflect Saybolt color of minimum 20. Cargoes typically trade based on the Mean of Platts Singapore (MOPS).

Australia jet fuel: Australian jet fuel is assessed on a C+F Sydney/Melbourne basis, for MR vessels. The assessments are based on Singapore plus applicable freight. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated. Effective January 2, 2019 Platts uses the Singapore-Australia 35kt clean MR freight assessments to calculate gasoline, gasoil and jet fuel CFR Australia netforward prices.

South Africa jet fuel/kerosene assessment: On August 1, 2018, Platts began assessing jet fuel/kerosene assessments on CFR South Africa basis. The new assessments reflect cargoes of 200,000 to 300,000 barrelsa on a delivered basis to South Africa. Platts calculates the netforward of the jet fuel/kerosene assessments CFR South Africa assessment by applying the Platts daily assessment for AG-South Africa 35,000 mt clean tanker assessment to the FOB Fujairah jet fuel/kerosene assessments.

GASOIL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Gasoil FOB Spore Cargo	POABC00	POABC03			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil FOB Spore Cargo sulfur ppm	POABCSF				FOB	Singapore				US$	Barrels	NA
Gasoil MOPS strip	AAPJY00	AAPJY03				Singapore				US$	Barrels	7.45
Gasoil MOPS strip sulfur ppm	AAPJYSF					Singapore				US$	Barrels	NA
Gasoil FOB Spore Cargo vs Gasoil MOPS strip	POAIC00	AAFDC00			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil FOB Spore Cargo vs Gasoil MOPS strip sulfur ppm	POAICSF				FOB	Singapore				US$	Barrels	NA
Gasoil 0.001% S (10 ppm) FOB Spore Cargo	AAOVC00	AAOVC03			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.001% S (10 ppm) FOB Spore vs Gasoil MOPS strip	AAOVD00	AAOVD03			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.001% S (10 ppm) MOP West India $/b	AAQWN00	AAQWN03			FOB	India		150,000	250,000	US$	Barrels	7.45
Gasoil 0.001% S (10 ppm) MOP West India $/mt	AAQWO00	AAQWO03			FOB	India		20,000	30,000	US$	Metric tons	7.45
Gasoil 0.001% S (10 ppm) CFR Australia Cargo	AAQUD00	AAQUD03			FOB	Australia		150,000	250,000	US$	Barrels	7.45
Gasoil 0.005% S (50 ppm) FOB Spore Cargo	AAPPF00	AAPPF03			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.005% S (50 ppm) FOB Spore Cargo vs Gasoil MOPS strip	AAPPH00	AAPPH03			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.001% S (10 ppm) FOB Arab Gulf Cargo	AAIDT00	AAIDT03			FOB	Arab Gulf				US$	Barrels	7.45
Gasoil 0.001% S (10 ppm) FOB Arab Gulf vs MOPAG Gasoil	AAIDU00	AAIDU03			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil 0.005% S(50 ppm) FOB Arab Gulf Cargo	AASGJ00	AASGJ03			FOB	Arab Gulf				US$	Barrels	7.45
Gasoil 0.005% S (50 ppm) FOB Arab Gulf vs MOPAG Gasoil	AASGK00	AASGK03			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil 0.05% S (500 ppm) FOB Arab Gulf Cargo	AAFEZ00	AAFFG00			FOB	Arab Gulf				US$	Barrels	7.45
Gasoil 0.05% S (500 ppm) FOB Arab Gulf vs MOPAG Gasoil	AAFFD00	AAFFE00			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil 0.05% S (500 ppm) MOP West India $/b	AAQWP00	AAQWP03			FOB	India		150,000	250,000	US$	Barrels	7.45
Gasoil 0.05% S (500 ppm) MOP West India $/mt	AAQWQ00	AAQWQ03			FOB	India		20,000	30,000	US$	Metric tons	7.45
Gasoil 0.05% S (500 ppm) FOB Spore Cargo	AAFEX00	AAFEY00			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.05% S (500 ppm) FOB Spore Cargo vs Gasoil MOPS strip	AAFFB00	AAFFC00			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.25% S (2500 ppm) FOB Arab Gulf Cargo	AACUA00	AACUB00			FOB	Arab Gulf				US$	Barrels	7.45
Gasoil 0.25% (2500 ppm) FOB Arab Gulf vs MOPAG Gasoil	AACUC00	AACUD00			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil 0.25% (2500 ppm) MOP West India $/b	AAQWR00	AAQWR03			FOB	India		150,000	250,000	US$	Barrels	7.45
Gasoil 0.25% (2500 ppm) MOP West India $/mt	AAQWS00	AAQWS03			FOB	India		20,000	30,000	US$	Metric tons	7.45
Gasoil 0.25% S (2500 ppm) FOB Spore Cargo	AACUE00	AACUF00			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil 0.25% S (2500 ppm) FOB Spore Cargo $/mt	AAXNB00	AAXNB03			FOB	Singapore	15-30 days	20,000	30,000	US$	Metric tons	7.45
Gasoil 0.25% S (2500 ppm) FOB Spore Cargo vs Gasoil MOPS strip	AACQI00	AACTZ00			FOB	Singapore	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil FOB Japan Cargo	POJAP00	POJAP03			FOB	Japan		150,000	250,000	US$	Barrels	7.45
Gasoil C+F Japan Cargo vs Gasoil MOPS strip	AAWVG00	AAWVG03			C+F	Japan		150,000	250,000	US$	Barrels	7.45
Gasoil FOB Arab Gulf Cargo	POAAT00	POAAT03			FOB	Arab Gulf				US$	Barrels	7.45
Gasoil FOB Arab Gulf Cargo sulfur ppm	POAATSF				FOB	Arab Gulf				US$	Barrels	NA
Gasoil FOB Arab Gulf vs MOPAG Gasoil	POAID00	AAFDG00			FOB	Arab Gulf	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil FOB Arab Gulf vs MOPAG Gasoil sulfur ppm	POAIDSF				FOB	Arab Gulf				US$	Barrels	NA
Gasoil LR2 FOB Arab Gulf Cargo	AAKBT00	AAKBU00			FOB	Arab Gulf				US$	Barrels	7.45
Gasoil LR2 FOB Arab Gulf Cargo sulfur ppm	AAKBTSF				FOB	Arab Gulf				US$	Barrels	NA

GASOIL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Gasoil FOB Fujairah Cargo	AFUJK00	AFUJK03			FOB	Fujairah	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil 10 ppm FOB Fujairah Cargo	AFUJP00	AFUJP03			FOB	Fujairah	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil MOPAG Strip	AFUJL00	AFUJL03				Arab Gulf				US$	Barrels	7.45
Gasoil FOB Korea Cargo	POAIE00	POAIF03			FOB	South Korea	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil FOB Korea Cargo sulfur ppm	POAIESF				FOB	South Korea				US$	Barrels	NA
Gasoil FOB Korea Cargo vs Gasoil MOPS strip	POAIG00	POAIH03			FOB	South Korea	15-30 days	150,000	250,000	US$	Barrels	7.45
Gasoil FOB Korea Cargo vs Gasoil MOPS strip sulfur ppm	POAIGSF				FOB	South Korea	15-30 days			US$	Barrels	NA
Gasoil LP C+F South China Cargo	POAFA00	POAFA03			C+F	China		10,000	30,000	US$	Metric Tons	7.45
Gasoil LP C+F South China Cargo sulfur ppm	POAFASF				C+F	China				US$	Metric Tons	NA
Gasoil LP C+F South China Cargo vs Gasoil MOPS strip	AABJZ00	AABKA00			C+F	China		70,000	200,000	US$	Barrels	7.45
Gasoil LP C+F South China Cargo vs Gasoil MOPS strip sulfur ppm	AABJZSF				C+F	China				US$	Metric Tons	NA
Gasoil 10 ppm CFR South Africa Cargo	AAQWU00	AAQWU03			C+F	South Africa	20-40 days	200,000	300,000	US$	Barrels	7.45
Gasoil 500 ppm CFR South Africa Cargo	AAQWV00	AAQWV03			C+F	South Africa	20-40 days	200,000	300,000	US$	Barrels	7.45

Gasoil

Gasoil (Singapore): Platts FOB Singapore assessments reflect "FOB Straits" bids, offers and transactions. For FOB Straits transactions, sellers are required to nominate loading from one of the locations in Singapore and Malaysia that are approved for the Platts Market on Close assessment process as a delivery point.

Platts' Singapore physical gasoil assessments reflect a minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication in the assessment process.

With effect from January 2, 2018 Platts amended the maximum sulfur content specified for the flagship Singapore Gasoil assessment to 10 ppm from the earlier 0.05% (500 ppm). At the same time, Platts lowered the maximum sulfur specification of its flagship Arab Gulf Gasoil netback assessment to 10 ppm. Grades which are not widely merchantable -- for instance, gasoil with contaminants that are banned in certain major importing countries, including fatty acid methyl esters (FAME) -- will not be reflected in the assessments. Platts understands that Indonesia, Australia, Japan and Sri Lanka all restrict FAME content in gasoil imports to "nil".

Platts publishes a list of recognized additives contained in the FOB Singapore gasoil assessment process. This list follows a study of submissions from market participants, and is intended to provide clarity to market participants regarding which additives are generally considered to be merchantable and accepted for cargoes delivered through the Platts MOC assessment process in Singapore. Platts assessments for FOB Singapore Gasoil (10 ppm) reflect the inclusion of additives in cargoes that have been historically acceptable for delivery. Fuel additives that have been broadly delivered and accepted in FOB Straits trades reported through the Platts MOC assessment process continue to be reflected in the assessments, and are included in this list. Gasoil delivered through the Platts MOC assessment process is expected to be additive-free, or contain the additives in this list.

The full list of additives is in the table.

Gasoil 10 ppm: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days forward from the date of publication. Specifications as defined in table.

Gasoil 50 ppm: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days forward from the date of publication. Specifications as defined in table.

Gasoil 0.05% sulfur: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days forward from the date of publication. Specifications as defined in table.

Gasoil 0.25% sulfur: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days from the date of publication. Specifications as defined in table.

China gasoil: The minimum volume assessed is 100,000 barrels or 10,000-15,000 mt. The sulfur content of the gasoil cargoes assessed for delivery into China is 10 ppm. Ports are Huangpu and Shenzhen in South China, and Hong Kong. Deals into

other areas are tracked but prices are different. Gasoil into North China may command a higher price due to geographical location. Assessment window is 15-30 days forward from the date of publication. On October 1, 2018, Platts discontinued the publication of its assessments for CFR South China 0.2% sulfur gasoil. The discontinuation stems from a lack of liquidity in the market underlying these physical assessments, as the supply of spot gasoil cargoes from those locational hubs have decreased over the years.

Japan gasoil: On October 1, 2018, Platts discontinued the publication of the FOB Okinawa and C+F Japan gasoil assessments. The discontinuation reflects a lack of spot market activity and changing patterns in trading underlying these physical assessments. As a result, there has been an absence of physical spot trades concluded on FOB Okinawa and C+F Japan basis.

On May 7, 2018, Platts launched FOB Japan gasoil assessments, reflecting cargoes with maximum 10 ppm sulfur. The assessment is derived using Platts Japan Domestic Oil Waterborne gasoil assessment, with cost normalized for the export market, including the removal of the implied taxed value. The final assessment is converted from yen per kiloliter to US dollar per barrel based on relevant currency conversion rates.

South Korea gasoil: Korea gasoil is assessed on a FOB Korea basis reflecting cargoes with maximum 10 ppm sulfur. Platts surveys the market to determine the tradable levels for cargoes loading 15-30 days forward from the date of publication.

Middle East gasoil: FOB Arab Gulf gasoil reflects gasoil with a maximum of 10 ppm sulfur, and is assessed as a netback to the Singapore Gasoil assessment, using 55,000 mt and 80,000 mt (LR2) freight rates. Freight rates reported in the Platts Clean Tankerwire are used for this netback. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated. The FOB Arab Gulf 0.25% sulfur, 0.05% sulfur and 0.005% sulfur assessments are derived by applying assessed spot premiums for those grades to the primary Gasoil assessment, minus the spot premium for standard 10 ppm gasoil itself.

Gasoil 0.005% sulfur (outright): Derived by applying spot differential assessed for 0.005% sulfur to the primary FOB AG Gasoil netback, minus the assessed spot AG differential for Gasoil itself.

Gasoil 0.05% sulfur (outright): Derived by applying spot differential assessed for 0.05% sulfur to the primary FOB AG Gasoil netback, minus the assessed spot AG differential for Gasoil itself.

Gasoil 0.25% sulfur (outright): Derived by applying spot differential assessed for 0.25% sulfur to the primary FOB AG Gasoil netback, minus the assessed spot AG differential for Gasoil itself.

Middle East gasoil spot differentials: Platts assesses spot differentials for gasoil. These assessments, which are published as a spot market premium/discount to Platts' existing Middle East gasoil netback assessment, reflect the value of gasoil cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of publication. Platts considers bids, offers, transactions, and reports of transactions when assessing this spot market differential.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Sitra, Fujairah, Ras Laffan and any safe and sound port within this geographic area.

FOB Fujairah Gasoil and Gasoil 0.001% sulfur assessments (outright): Platts assesses outright values for Gasoil and Gasoil 0.001% sulfur cargoes on FOB Fujairah basis. The assessments reflect the value of Gasoil and Gasoil 0.001% sulfur, typically 200,000 to 300,000 barrels each, for loading 20-40 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessments equal the sum of the Middle East Gasoil or Gasoil 0.001% sulfur spot differentials (premium/discount) and the MOPAG Gasoil strip. The MOPAG Gasoil strip is calculated using Gasoil derivatives that settle on Platts Middle East Gasoil netback assessments. Platts also publishes assessments for MOPAG Gasoil derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG Gasoil strip.

India gasoil: The Mean of Platts West India Netbacks (MOPWIN) assessments for 10 ppm, 500 ppm and 0.25% sulfur gasoil are derived by deducting freight costs from the assessments for the same product in Singapore. The assessments are direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India-Singapore clean freight assessments used for generating the netback values can be found in the Platts Clean Tankerwire.

Australia gasoil: Platts assesses 10 ppm gasoil on a C+F Sydney/Melbourne basis, in US dollars per barrel. The assessment reflects cargoes for MR vessels. The assessments are based on Singapore plus applicable freight. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated. Effective January 2, 2019, Platts uses the Singapore-Australia 35kt clean MR freight assessments to calculate gasoline, gasoil and jet fuel CFR Australia netforward prices.

South Africa gasoil assessment: On August 1, 2018, Platts began assessing 10 ppm and 500 ppm gasoil assessments on CFR South Africa basis. The new assessments reflect cargo sizes of 200,000-300,000 barrels on a delivered basis to South Africa. Platts calculates the netforward of the 10 ppm CFR South Africa assessment by applying the Platts daily assessment for AG-South Africa 35,000 mt clean tanker assessment to the FOB Fujairah 10 ppm assessment. The CFR South Africa Gasoil 500 ppm assessment is calculated by applying the FOB AG Gasoil 500 ppm premium/discount to the MOPAG Gasoil Strip, and adding the Platts AG-South Africa 35,000 mt clean tanker assessment to this.

FOB SINGAPORE GASOIL / DIESEL SPECIFICATIONS

				0.001%S	0.005%S	0.05%S	0.25%S	
			Unit	**10 ppm**	**50 ppm**	**500 ppm**	**2500 ppm**	**Test Methods**
Acid Number, Total		Max	mg KOH/g	0.3	0.5	0.5	0.5	ASTM D664
Appearance @ 25°C	Pass Procedure 1		Visual test	Clear & bright, without undissolved sediment or free water	Clear & bright, without undissolved sediment or free water	Clear & bright, without undissolved sediment or free water		ASTM D4176 Proc 2
Ash content		Max	% weight	0.01	0.01	0.01	0.01	ASTM D482, EN ISO 6245
Cetane Index	Min		Range 0-100	46	48	48	48	ASTM D4737, EN ISO 4264
Cetane Number	Min		Range 0-100	51				ASTM D613, EN ISO 5165
Conradson Carbon Residue (10% distillation)		Max	% mass	0.2	0.2	0.2	0.1	ASTM D4530, EN ISO 10370
CFPP (Cold filter plugging point)		Max	°C	Minus 5				EN 116 / IP 309
Cloud point		Max	°C	Minus 1				ASTM 2500, ISO 3015-92, JIS K 2269-87, EN 23015
Color		Max	Grade	2	2	2	2	ASTM D1500 / IP 196
Conductivity @ 20°C	Min		pS/m	150				ASTM D2624, EN ISO 6297:1997
Copper corrosion (3 hrs @ 50°C)		Max	Class	1	1	1	1	ASTM D130, EN ISO 2160
Density @ 15°C	Min-	Max	g/ml	0.820-0.845	0.82-0.86	0.82-0.86	0.82-0.86	ASTM D4052, EN ISO 3675
Distillation T90 (90% recovered)		Max	°C				360	ASTM D86, EN ISO 3405:1998
Distillation T95 (95% recovered)		Max	°C	360	360	370		ASTM D86, EN ISO 3405:1998
Distillation volume recovered @ 250°C		Max	%	65				EN ISO 3405:1998
Distillation volume recovered @ 350°C	Min		%	85				EN ISO 3405:1998
Filter blocking tendency		Max		2				ASTM D2068, IP 387
Flash point	Min		°C	66	66	66	66	ASTM D93, EN 22719
Fatty acid methyl esters (FAME)		Max	%	NIL	NIL	NIL	NIL	ASTM D7371
Kinematic viscosity @ 40°C	Min-	Max	CST	2.0-4.5	2.0-4.5	2.0-4.5	2.0-4.5	ASTM D445, EN ISO 3104
Lubricity (HFRR) (WSD 1,4) @ 60°C		Max	microns	460	460	460	460	ASTM D6079, IP 450, ISO 12156-1
Odor				Merchantable				
Oxidation stability		Max	mg/L	25				ASTM D2274, EN ISO 12205
Particulate matter		Max	mg/kg	24				EN 12662
Polyaromatic hydrocarbons (PAHs)		Max	% weight	11	11			IP 391:1995
Pour point		Max	°C		9	9	9	ASTM D97
Sulfur content		Max	ppm	10	50	500	2500	ASTM D5453, EN ISO 20846/7 & 20884
Water content		Max	mg/kg	200				EN ISO 12937
Water & sediment		Max	% volume	0.05	0.05	0.05	0.05	ASTM D2709

ADDITIVES IN SINGAPORE AND THE MIDDLE EAST 10PPM

Additive type	Manufacturer	Name
Antioxidant	Lanxess	BAYNOX Solution 20%
Antioxidant	Dorf Ketal	DORF 410C
Antioxidant	Dorf Ketal	SR 1546
Antioxidant	Ondeo Nalco	EC 3053A
Antioxidant	Betz	Spec-Aid 8Q5400
Antioxidant	Lanxess	Vulkanox 4005
Antioxidant; Metal Deactivator	Innospec	DGS-139
Metal Deactivator	Afton	HiTEC 4705E
Antioxidant	Afton	HiTEC 4733
Cetane Improver	Ceptro Micet	2-Ethyl Hexyl Nitrate
Cetane Improver	Deepak Nitrite	2-Ethyl Hexyl Nitrate
Cetane Improver	Eurenco	2-Ethyl Hexyl Nitrate
Cetane Improver	Innospec	2-Ethyl Hexyl Nitrate
Cetane Improver	Innospec	C1-0801
Cetane Improver	Very One	2-Ethylhexyl Nitrate
Cetane Improver	Dorf Ketal	Cepro 100
Cetane Improver	Innospec	CI-0801
Cetane Improver	WRT BV	HFA 3033
Cetane Improver	Afton	HiTEC 4103W
Cetane Improver	Lubrizol	Lubrizol 8090
Cetane Improver	Total	Total RV100
Cetane Improver	Zenteum	Zenteum ZR688
Cetane Improver	Kutch Chemical	2-Ethyl Hexyl Nitrate
Cetane Improver	Nalco	Nalco EC5308A
Cetane Improver	Xi'an Wonder Energy Chemical Co	WD12-501
Cold Flow Improver	Total	7000L
Cold Flow Improver	Total	CP 7134 L
Cold Flow Improver	Dorf Ketal	SR1637
Cold Flow Improver	Dorf Ketal	SR1647
Cold Flow Improver	Dorf Ketal	SR 1609
Cold Flow Improver	Infineum	Infineum R420
Cold Flow Improver	Infineum	Infineum R765
Cold Flow Improver	Total	CP 7000L
Cold Flow Improver	Clariant	Dodiflow 4028
Cold Flow Improver	Clariant	Dodiflow 4032
Cold Flow Improver	Clariant	Dodiflow 4313
Cold Flow Improver	Clariant	Dodiflow 6087
Cold Flow Improver	Clariant	Dodiflow 4985
Cold Flow Improver	Clariant	Dodiflow 5251
Cold Flow Improver	Clariant	Dodiflow 4744

Additive type	Manufacturer	Name
Cold Flow Improver	Clariant	Dodiflow 3905
Cold Flow Improver	Dorf Ketal	SR 1690
Cold Flow Improver	Infineum	Infineum R587
Cold Flow Improver	Infineum	Infineum R590
Cold Flow Improver	Infineum	Infineum R773
Cold Flow Improver	Infineum	R274
Cold Flow Improver	Infineum	R275D
Cold Flow Improver	BASF	Keroflux 6170
Cold Flow improver	BASF	Keroflux 6206
Cold Flow Improver	BASF	Keroflux 6214
Cold Flow Improver	Innospec	OFI 7650
Cold Flow Improver	CHIMEC	CH6835
Cold Flow Improver	Dorf Ketal	SR1651
Cold Flow Improver	Nalco Champion	EC5918A
Cold Flow Improver	Nalco Champion	EC5967A
Cold Flow Improver	Infineum	R225D
Cold Flow Improver	Infineum	R294
Cold flow improver	Infineum	R283
Cold flow improver	Infineum	R387
Cold flow improver	Innospec	OFI 8863
Cold flow improver	Innospec	OFI 8851
Cold flow improver	Innospec	OFI 7620
Cold flow improver	Innospec	OFI 7683
Conductivity Improver	Dorf Ketal	SR 1795
Conductivity Improver	Innospec (formerly Octel)	Stadis 425
Conductivity Improver	Innospec (formerly Octel)	Stadis 450
Conductivity Improver	Nalco	Nalco EC5580A
Conductivity Improver	Baker Hughes	T3514
Corrosion Inhibitor	Innospec	DCI-4A
Corrosion Inhibitor	Nalco	Nalco 5403
Corrosion Inhibitor	Afton	AvGuardTM CI/LI
Flow Improver	Sanyo Chemicals	Carroyl MD-336K
Flow Improver	Dorf Ketal	SR1649
Flow Improver	Infineum	Infineum R222
Flow Improver	Infineum	Infineum R240
Flow Improver	Infineum	Infineum R241
Flow Improver	Infineum	Infineum R375
Flow Improver	Infineum	Infineum R395
Flow Improver	Infineum	Infineum R396
Flow Improver	Infineum	Infineum R570
Flow Improver	Infineum	Infineum R567K

Additive type	Manufacturer	Name
Flow Improver	Infineum	Infineum R571
Flow Improver	Infineum	Infineum R594
Flow Improver	Infineum	Infineum R773
Flow Improver	Infineum	Infineum R756
Flow Improver	Infineum	Infineum R779
Flow Improver	Infineum	Infineum R575
Flow Improver	Sunhib	Sunhib S-206
Flow Improver / Lubricity	Infineum	Infineum R216
Lubricity Improver	Dorf Ketal	SR2008
Lubricity Improver	Dorf Ketal	SR2010
Lubricity Improver	WRT bv	HFA 7025
Lubricity Improver	Infineum	Infineum R655
Lubricity Improver	Lubrizol	LZ539M
Lubricity Improver	Chevron Texaco	ODA 78010
Lubricity Improver	Innospec	OLI 5500
Lubricity Improver	Infineum	Infineum R671
Lubricity Improver	Nalco	Nalco EC5713A
Lubricity Improver	Baker Petrolite	Tolad 5051C
Lubricity Improver	NOF Corporation Japan	LE 772W
Lubricity Improver	Sanyo Chemicals	Sanfric FM-6C
Lubricity Improver	Infineum	Infineum R650
Lubricity Improver	Nalco	Nalco EC5719A
Lubricity Improver	Total	PC 32
Lubricity Improver	Baker Hughes	T9121
Lubricity Improver	Afton	HiTEC 4140A
Lubricity Improver	Infineum	Infineum R650D
Lubricity Improver	Infineum	Infineum R655D
Lubricity Improver	Total	PC 60
Lubricity Improver	Infineum	R646
Lubricity improver	Innospec	OLI-8000
Metal Deactivator	Innospec	DMD-2
WAFI Cold Flow	Infineum	Infineum R705
WAFI Cold Flow	Infineum	Infineum R231
WAFI Cold Flow	Infineum	Infineum R344
WAFI Cold Flow	Infineum	Infineum R709
MDFI Cold Flow	Infineum	Infineum R225
MDFI Cold Flow	Total	CP7870 C
MDFI Cold Flow	Total	CP7870 D
MDFI Cold Flow	Total	CP7000
WASA Cold Flow	Infineum	Infineum R799
Cold filter plugging point	Cargo Treatment Services	CTS-28-84

FOB MOPAG GASOIL SPECIFICATIONS

				0.001%S	
			Unit	10 ppm	Test Methods
Acid Number, Total		Max	mg KOH/g	0.3	ASTM D664
Appearance @ 25°C	Pass Procedure 1		Visual test	Clear & bright, without undissolved sediment or free water	ASTM D4176 Proc 2
Ash content		Max	% weight	0.01	ASTM D482, EN ISO 6245
Cetane Index	Min		Range 0-100	46	ASTM D4737, EN ISO 4264
Cetane Number	Min		Range 0-100	51	ASTM D613, EN ISO 5165
Conradson Carbon Residue (10% distillation)		Max	% mass	0.2	ASTM D4530, EN ISO 10370
CFPP (Cold filter plugging point)		Max	°C	Minus 5	EN 116 / IP 309
Cloud point		Max	°C	Minus 1	ASTM 2500, ISO 3015-92, JIS K 2269-87, EN 23015
Color		Max	Grade	2	ASTM D1500 / IP 196
Conductivity @ 20°C	Min		pS/m	150	ASTM D2624, EN ISO 6297:1997
Copper corrosion (3 hrs @ 50°C)		Max	Class	1	ASTM D130, EN ISO 2160
Density @ 15°C	Min-	Max	g/ml	0.820-0.845	ASTM D4052, EN ISO 3675
Distillation T90 (90% recovered)		Max	°C		ASTM D86, EN ISO 3405:1998
Distillation T95 (95% recovered)		Max	°C	360	ASTM D86, EN ISO 3405:1998
Distillation volume recovered @ 250°C		Max	%	65	EN ISO 3405:1998
Distillation volume recovered @ 350°C	Min		%	85	EN ISO 3405:1998
Filter blocking tendency		Max		2	ASTM D2068, IP 387
Flash point	Min		°C	66	ASTM D93, EN 22719
Fatty acid methyl esters (FAME)		Max	%	NIL	ASTM D7371
Kinematic viscosity @ 40°C	Min-	Max	cSt	2.0-4.5	ASTM D445, EN ISO 3104
Lubricity (HFRR) (WSD 1,4) @ 60°C		Max	microns	460	ASTM D6079, IP 450, ISO 12156-1
Odor				Merchantable	
Oxidation stability		Max	mg/L	25	ASTM D2274, EN ISO 12205
Particulate matter		Max	mg/kg	24	EN 12662
Polyaromatic hydrocarbons (PAHs)		Max	% weight	11	IP 391:1995
Pour point		Max	°C		ASTM D97
Sulfur content		Max	ppm	10	ASTM D5453, EN ISO 20846/7 & 20884
Water content		Max	mg/kg	200	EN ISO 12937
Water & sediment		Max	% volume	0.05	ASTM D2709

FUEL OIL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
FO 180 CST 3.5% S FOB Spore Cargo	PUADV00	PUADV03			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST 3.5% S FOB Spore Cargo vs FO 180 CST MOPS strip	AAGZF00	AAGZG00			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST 2.0% S FOB Spore Cargo	PUAXS00	PUAXS03			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST FOB Arab Gulf Cargo	PUABE00	PUABE03			FOB	Arab Gulf		20,000	40,000	US$	Metric Tons	6.35
FO 180 CST FOB Arab Gulf vs MOPAG 180 CST	AAXJA00	AAXJA03			FOB	Arab Gulf	20-40 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST vs FO 380 CST FOB Arab Gulf	PPXDM00	AAFDI00			FOB	Arab Gulf	20-40 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST 3.5% S C+F Japan Cargo	PUACJ00	PUACJ03			C+F	Japan		20,000	40,000	US$	Metric Tons	6.35
FO 180 CST 3.5% S FOB Korea Cargo	PUBDP00	PUBDQ03			FOB	South Korea	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST 3.5% S FOB Korea Cargo vs FO 180 MOPS strip	PUBDR00	PUBDS03			FOB	South Korea	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST 3.5% S MOPS Strip	AAPJX00	AAPJX03				Singapore				US$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Spore Cargo	PPXDK00	PPXDP03			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Spore Cargo sulfur ppm	PPXDKSF				FOB	Singapore		20,000	40,000	US$	Metric Tons	NA
FO 380 CST MOPS Strip	AAPJW00	AAPJW03				Singapore				US$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Spore Cargo vs FO 380 CST MOPS strip	PPXDL00	AAFDD00			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 380 CST 3.5% FOB Arab Gulf Cargo	AAIDC00	AAIDD00			FOB	Arab Gulf	20-40 days	20,000	40,000	US$	Metric Tons	6.35
FO 380 CST FOB Arab Gulf vs MOPAG 380 CST	AAXJB00	AAXJB03			FOB	Arab Gulf	20-40 days	20,000	40,000	US$	Metric Tons	6.35
FO 380 CST FOB Fujairah Cargo	AFUJQ00	AFUJQ03			FOB	Fujairah	20-40 days	20,000	40,000	US$	Metric Tons	6.35
FO 380 CST MOPAG Strip	AFUJR00	AFUJR03				Arab Gulf				US$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Korea Cargo	PUBDY00	PUBDZ03			FOB	South Korea	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Korea Cargo vs FO 380 MOPS strip	PUBEA00	PUBEB03			FOB	South Korea	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FO 180 CST MOPAG Strip	AAYBD00	AAYBD03				Fujairah				US$	Metric Tons	6.35
FO 380 CST Ex-wharf Fujairah	AAYBF00	AAYBF03			Ex-wharf	Fujairah	5-15 days	2,000	7,000	US$	Metric Tons	6.35
Ex-wharf Fujairah 380 CST vs MOPAG 180 CST strip	AAYBG00	AAYBG03			Ex-wharf	Fujairah	5-15 days	2,000	7,000	US$	Metric Tons	6.35
FOB Spore Marine Fuel 0.5% Cargo	AMFSA00	AMFSA03			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FOB Spore Marine Fuel 0.5% MOPS strip	FOFSA00	FOFSA03				Singapore				US$	Metric Tons	6.35
FOB Spore Marine Fuel 0.5% Cargo vs Marine Fuel 0.5% MOPS strip	FOFSB00	FOFSB03			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FOB Spore Marine Fuel 0.5% Cargo vs FO 380 CST MOPS strip	AMOPA00	AMOPA03			FOB	Singapore	15-30 days	20,000	40,000	US$	Metric Tons	6.35
FOB Fujairah Marine Fuel 0.5% Cargo	AMFFA00	AMFFA03			FOB	Fujairah	20-40 days	20,000	40,000	US$	Metric Tons	6.35
FOB Fujairah Marine Fuel 0.5% MOPFUJ strip	FOFFA00	FOFFA03				Fujairah				US$	Metric Tons	6.35
FOB Fujairah Marine Fuel 0.5% Cargo vs Marine Fuel 0.5% MOPFUJ strip	FOFFB00	FOFFB03			FOB	Fujairah	20-40 days	20,000	40,000	US$	Metric Tons	6.35

Fuel oil

Singapore fuel oil: Platts FOB Singapore assessments reflect "FOB Straits" bids, offers and transactions. Effective January 2, 2019, all Platts fuel oil cargo and bunker assessments reflect specifications defined by the International Organization for Standardization in document ISO 8217:2010 Petroleum products - Fuels (class F) - Specifications of marine fuels. For FOB Straits transactions, sellers are required nominate loading from one of the locations in Singapore and Malaysia that are approved for the Platts Market on Close assessment process as a delivery point.

All fuel oil assessments are typically based on cracked material. In Singapore, the HSFO 180 CST and HSFO 380 CST assessments reflect transactions, bids and offers for parcels of a minimum of 20,000 mt, maximum 40,000 mt per transaction, loading 15-30 days forward from the date of publication. Market participants should specify loading for a five-day date range when submitting bids and offers for publication.

Any terminal nominated for performance on FOB Straits fuel oil transaction concluded during the Platts assessment process should be able to receive an Aframax-sized vessel, which typically weighs 80,000 to 120,000 deadweight tons when fully loaded. The terminal should typically be able to manage at least one co-load of standard-sized cargoes of 20,000 mt to 40,000 mt. For instance, a vessel which is already carrying 20,000 mt of fuel oil should be able to load at least another 20,000 mt from a second terminal, without draft restrictions hindering a vessel's ability to leave the port.

Platts assesses 2.0% and 3.5% sulfur 180 CST, 3.5% sulfur 380 CST FOB Singapore fuel oil and FOB Singapore Marine Fuel 0.5%.

Marine Fuel 0.5%: Platts launched daily cargo and barge assessments for Marine Fuel 0.5% reflecting residual marine fuels (RMG fuels as defined by the International Organization for Standardization in document ISO 8217:2010 Petroleum products - Fuels (class F) - Specifications of marine fuels) with a maximum sulfur limit of 0.5% across the globe starting January

SINGAPORE'S STANDARD SPECS FOR 380 CENTISTOKE FUEL OIL

Property	Standard
Kinematic viscosity at 50°C, Max	380 CST
Specific gravity at 15°C kg/cu m Max	991
CCAI	870
Sulfur mass Max	3.50%
Flash point Min	60 deg C
Hydrogen sulfide	2 mg/kg
Acid Number Max	2.5 mg KOH/g
Total sediment aged	0.10%
Carbon residue: micro method Max	18%
Pour point Max	30 deg C
Water Max	0.50%
Ash Max	0.10%
Vanadium Max	350 mg/kg
Sodium Max	100 mg/kg
Aluminium + Silicone Max	60 mg/kg
ULO	The fuel shall be free from ULO

* Platts fuel oil and bunker assessments reflect specifications defined by the International Organization for Standardization in document ISO 8217:2010 Petroleum products - Fuels (class F) - Specifications of marine fuels

SINGAPORE'S STANDARD SPECS FOR 180 CENTISTOKE FUEL OIL, 3.5% SULFUR

Property	Standard
Kinematic viscosity at 50°C, Max	180 CST
Specific gravity at 15°C kg/cu m Max	991
CCAI	860
Sulfur mass Max	3.50%
Flash point Min	60 deg C
Hydrogen sulfide	2 mg/kg
Acid Number Max	2.5 mg KOH/g
Total sediment aged	0.10%
Carbon residue: micro method Max	15%
Pour point Max	30 deg C
Water Max	0.50%
Ash Max	0.07%
Vanadium Max	150 mg/kg
Sodium Max	50 mg/kg
Aluminium + Silicon Max	50 mg/kg
ULO	The fuel shall be free from ULO

* Platts fuel oil and bunker assessments reflect specifications defined by the International Organization for Standardization in document ISO 8217:2010 Petroleum products - Fuels (class F) - Specifications of marine fuels

SINGAPORE'S STANDARD SPECS FOR MARINE FUEL 0.5% SULFUR

Property	Standard
Specific gravity at 15°C kg/cu m Max	991
CCAI	870
Sulfur mass Max	0.50%
Flash point Min	60 deg C
Hydrogen sulfide	2 mg/kg
Acid Number Max	2.5 mg KOH/g
Total sediment aged	0.10%
Carbon residue: micro method Max	18%
Pour point Max	30 deg C
Water Max	0.50%
Ash Max	0.10%
Vanadium Max	350 mg/kg
Sodium Max	100 mg/kg
Aluminium + Silicone Max	60 mg/kg
ULO	The fuel shall be free from ULO

*Platts fuel oil and bunker assessments reflect specifications defined by the International Organization for Standardization in document ISO 8217:2010 Petroleum products - Fuels (class F) - Specifications of marine fuels

SINGAPORE'S STANDARD SPECS FOR 180 CENTISTOKE FUEL OIL, 2.0% SULFUR

Property	Standard
Kinematic viscosity at 50°C, Max	180 CST
Specific gravity at 15°C kg/cu m Max	991
CCAI	860
Sulfur mass Max	2.00%
Flash point Min	60 deg C
Hydrogen sulfide	2 mg/kg
Acid Number Max	2.5 mg KOH/g
Total sediment aged	0.10%
Carbon residue: micro method Max	15%
Pour point Max	30 deg C
Water Max	0.50%
Ash Max	0.07%
Vanadium Max	150 mg/kg
Sodium Max	50 mg/kg
Aluminium + Silicon Max	50 mg/kg
ULO	The fuel shall be free from ULO

* Platts fuel oil and bunker assessments reflect specifications defined by the International Organization for Standardization in document ISO 8217:2010 Petroleum products - Fuels (class F) - Specifications of marine fuels

2, 2019. Platts assessments take into consideration trading activity reported in Marine Fuel 0.5% and other relevant low sulfur material within the Asia and Middle East markets.

FOB Singapore Marine Fuel 0.5%: The assessment reflects FOB Straits bids, offers and trades for 20,000-40,000 mt cargoes loading 15 to 30 days forward from the date of publication. Market participants should specify loading for a five-day date range when submitting bids and offers for publication. From May 2, 2019, Platts began publishing assessments for FOB Singapore Marine Fuel 0.5% derivatives. Platts publishes derivatives assessments for balance month, 12 subsequent months, inter-month spreads and four quarters from the month of publication. In addition, Platts publishes a MOPS strip for Marine Fuel 0.5% as well as a FOB Singapore Marine Fuel 0.5% differential to the strip.

FOB Fujairah Marine Fuel 0.5%: The assessment reflects bids, offers and trades for cargoes typically 20,000 to 40,000 mt each, for loading 20 to 40 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. Cargoes loading from any safe and sound port within the region would be considered for the assessment and normalized for loading on FOB Fujairah basis. From May 2, 2019, Platts began publishing assessments for FOB Fujairah Marine Fuel 0.5% derivatives. Platts publishes derivatives assessments for balance month and two subsequent months. In addition, Platts publishes a MOPFUJ strip for Marine Fuel 0.5% as well as an FOB Fujairah Marine Fuel 0.5% differential to the strip.

Following a detailed review of the market relationship between medium sulfur and low sulfur fuel oil FOB Singapore, Platts amended its methodology for assessing FOB Singapore 180 CST 2% sulfur cargoes. With effect from January 2, 2014, Platts assesses this value by applying a standard quality premium to its benchmark FOB Singapore HSFO 180 CST 3.5% sulfur assessment. Platts established this quality premium at 2.25% of the base value of FOB Singapore HSFO 180 CST 3.5%. For example, if Platts assesses the value of HSFO 180 CST 3.5% at $600/mt, the quality premium would be $13.50/mt and the outright price assessment for 180 CST 2% would be $613.50/mt. Platts made this adjustment to reflect the fact that liquidity in the medium sulfur fuel oil market has diminished to very low levels across Asia. The value reflects the relative premiums for the medium sulfur fuel over the period 2011-2013.

From July 2, 2012, Platts decreased the maximum specified allowable sulfur in its HSFO 180 CST and HSFO 380 CST assessments to 3.5%, lower from the previous ceiling of 4%. Any fuel oil cargo delivered as a result of a transaction completed and reported during the Platts Market on Close assessment process should be merchantable, including 180 CST fuel oil, which regularly moves within the utility and bunker markets. Among other characteristics, fuel oil should not contain Used Lubricants Oil (ULO), which would render fuel oil undeliverable into the bunkering market. Platts does not reflect fuel oil cargoes in its assessment process where ULOs are determined to be present.

South Korea fuel oil: Platts assesses 180 CST and 380 CST cargoes FOB South Korea. The assessments reflect parcels of around 30,000 mt loading 15-30 days forward. These cargoes typically trade linked to Mean of Platts Singapore 180 CST 3.5% sulfur assessment. Platts also assesses premiums/discounts to the Mean of Platts Singapore for each grade.

Japan fuel oil: Platts assesses 180 CST cargoes delivered into the Chiba area. The C+F Japan assessment is a netforward from the FOB Singapore HSFO 180 CST 3.5% sulfur assessment using 80,000 mt freight rates published in the Platts Dirty Tankerwire. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated. The assessments reflect parcels of around 30,000 mt loading 15-30 days forward. These cargoes typically trade linked to Mean of Platts Singapore, 180 CST 3.5% sulfur assessment.

Middle East fuel oil: The Arab Gulf fuel oil HSFO 180 CST assessment is a netback to Singapore using 80,000 mt freight rates. Freight rates reported in the Platts Dirty Tankerwire are used to derive the FOB Arab Gulf fuel oil assessment. Density in the Arab Gulf varies and assessments include 0.96-0.975 kg/l. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated.

FSU FOB SINGAPORE

Vessel name	Vessel's operator	Vessel's delivered date	IMO number	Flag	Vessel's anchored location	Type of hull	Summer deadweight
Energy Star	Nathalin Offshore Pte Ltd	31-Mar-97	9118393	Thailand	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	309,966
Jubilee Star	Nathalin Shipping Pte Ltd	14-Nov-96	9118381	Thailand	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	309,892
CS Prosperity	CSHA Shipping Co Ltd	05-Jan-99	9169691	Marshall Islands	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	311,224
Grace Star	Nathalin Shipping Pte Ltd	29-Jun-01	9205093	Thailand	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	312,638
CS Innovation	CSZ Shipping Co. Ltd.	14-Nov-97	9158886	Marshall Islands	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	299,885
CS Development	CSH Shipping Co. Ltd	30-Jun-97	9133850	Marshall Island	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	300,955
CS Brilliance	CSHB Shipping Co. Ltd.	31-Mar-98	9153513	Marshall Islands	Tanjung Pelepas, Johor state in southern Malaysia	Double Hull	299,999

The Arab Gulf fuel oil HSFO 380 CST value is assessed as a netback to Singapore using 80,000 mt freight rates. Freight rates reported in the Platts Dirty Tankerwire are used to derive the FOB Arab Gulf fuel oil assessment. See "Platts netback methodology in Asia and the Middle East" at the end of this document for more information on how these values are calculated.

Middle East fuel oil spot differentials: Platts assesses spot differentials for fuel oil. These assessments, which are published as a spot market premium/discount to Platts' existing Middle East fuel oil netback assessments, reflect the value of fuel oil cargoes, typically 20,000 to 40,000 mt each, for loading or delivery 20 to 40 days forward from the date of publication. Platts considers bids, offers, transactions, and reports of transactions when assessing this spot market differential. Platts assesses differentials for the following grades: HSFO 180 CST (premium/discount to HSFO 180 CST netback) and HSFO 380 CST (premium/discount to HSFO 380 CST netback). Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Sitra, Fujairah, Ras Laffan and any safe and sound port within this geographic area. The assessments are normalized to loadings in Fujairah for fuel oil.

FOB Fujairah 380 CST Fuel Oil assessment (outright): From October 3, 2016 Platts began assessing outright value for 380 CST fuel oil cargoes on FOB Fujairah basis. The assessment reflects the value of 380 CST fuel oil cargoes, typically 20,000 to 40,000 mt each, for loading 20 to 40 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Middle East 380 CST Fuel Oil spot differentials (premium/discount) and MOPAG 380 CST strip. The MOPAG strip is calculated using 380 CST Fuel Oil derivatives that settle on Platts Middle East 380 CST Fuel Oil netback assessments. From October 3, 2016, Platts also started publishing assessments for MOPAG 380 CST Fuel Oil derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG 380 CST Fuel Oil strip.

FOB Fujairah 380 CST Fuel Oil ex-wharf: From April 3, 2017 Platts began assessing Fujairah ex-wharf 380 CST fuel oil on an outright basis and a floating price basis. The assessment reflects spot trading activity in 5,000 mt parcels of 380 CST fuel oil for lifting five to 15 days forward from the date of publication. Platts considers bids, offers and trades for volumes between 2,000 mt and up to a maximum of 7,000 mt, with values normalized to 5,000 mt where needed. Market participants should specify loading for a three-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Ex-wharf Fujairah 380 CST Fuel Oil spot differentials (premium/discount) and the MOPAG 180 CST strip. Platts also publishes assessments for MOPAG 180 CST Fuel Oil derivatives for Balance Month, Month 1 and Month 2, at 4:30 pm and 5:30 pm Singapore time as well as a forward strip value for 5-15 days at 5:30 pm Singapore time.

From August 1, 2017 Platts amended the timestamp for the Fujairah ex-wharf fuel oil assessments to 5:30 pm Singapore time or 1:30 pm Fujairah time, to more closely reflect peak trading activity.

Parcels may be delivered via inter-tank transfers where possible, or to the buyer's nominated vessel/barge from an onshore terminal or offshore vessel within the port limits of Fujairah. The buyer should nominate the barge/vessel between two to five working days in advance of the load date as per current industry practices at the various load terminals. The seller should notify the buyer of barge acceptance promptly and within a reasonable time. But the acceptance is subject to terminal availability. Seller should supply material that is merchantable.

Floating Storage Units: Platts removed the tanker Marine Star as an additional delivery point in the FOB Singapore fuel oil MOC process from August 1, 2019. The full list of vessels approved as delivery points in the FOB Singapore fuel oil MOC can be found in the table. The standards applicable to approved floating storage units require that sellers specifically name the vessel used as delivery point at the time of providing an offer for publication in the Platts MOC assessment process. Any vessel accredited for the FOB Singapore fuel oil assessment process would be on a FOB FSU basis only, and cannot be nominated into a FOB Straits transaction reported during the MOC process except by mutual agreement between counterparties.

LSWR

Platts discontinued the FOB Indonesia LSWR and FOB Indonesia LSWR Mixed/Cracked assessments from April 1, 2019, and recommended a one-time differential of minus $3.50/b for FOB Indonesia LSWR and plus $1/b for FOB Indonesia LSWR Mixed/Cracked to Platts FOB Singapore Marine Fuel 0.5% assessment that may be used in amending LSWR contracts which settle against Platts LSWR assessments after April 1, 2019. The discontinuation follows decline in spot market activity for LSWR across the Asia Pacific on falling production due to refinery upgrades. Platts FOB Singapore Marine Fuel 0.5% assessment is published in US dollar per metric ton ($/mt). The assessment currently reflects a metric ton-to-barrel conversion factor of 6.35. Platts published FOB Indonesia LSWR and FOB Indonesia LSWR Mixed/Cracked assessments in $/b, reflecting conversion factors of 6.50 and 6.80, respectively.

Platts netback methodology in Asia and the Middle East (2019 rates)

The following document contains the methodology for product netbacks and netforwards used in Asia-Pacific.

Please note that the flat rates are changed once a year on the first working day of the new year and are applicable till the last working day of the year.

Platts publishes freight spot assessments for dirty and clean tankers. The freight assessments are published primarily as percentages against a Worldscale (WS) rate.

In the following examples, the base rate is multiplied against the spot market multiplier to obtain the actual freight cost. For example, a Worldscale rate of 200 implies a freight rate that is twice the base rate.

This document outlines Platts' freight methodology for gasoline, naphtha, fuel oil, gasoil/jet kero and Australian netback assessments.

Gasoline freight methodology

Singapore to Jebel Ali at 12.63

(Quoin Island to Singapore + Jebel Ali to Quoin Island)

FOB AG 95 RON:

Jebel Ali to Quoin Is	= 0.77
Quoin Is to Singapore	= 10.77
Jebel Ali port charges	= 1.09
	——
	TOTAL = 12.63
	——

Formula: Freight = Spot WS x 12.63/ 8.5

To convert between metric tons and barrels use 8.5.

Naphtha freight methodology

1. Singapore netback

Freight rate methodology for Singapore to Japan:

Base rate from Singapore to Chiba, Japan equals $10.80/mt

Formula: Freight = Spot WS x 30 / 26.25 x 10.80

2. Arab Gulf netback

Quoin Island to Chiba/Yokohama base rate equals $20.78/mt

Jubail/Mina Al Ahmadi to Quoin Island	2.33+ 0.27 = 2.60
Mina Al Ahmadi /Ras Tanura to Quoin Island	2.30+0.27= 2.57
Ruwais/Mina Abdulla to Quoin Island	2.71
	———————–
	7.88/ 3 = 2.63

AG to Chiba = Base rate Quoin Island to Chiba/Yokohama	20.78
plus average of 6 ports to Quoin Island	2.63
	Total: $23.41/mt

Formula: Freight = Spot WS x 55 / 52.50 x 23.41

For Naphtha LR2 netback:

Spot 75,000 mt: Freight = Spot WS x 23.41

Fuel Oil freight methodology

1. Japan netback

Singapore to Chiba/Yokohama, Japan: The freight rate is $ 11.87/mt. This amount is multiplied by the Worldscale rate between Singapore and Japan. The amount is then added to the Singapore fuel oil assessment.

Formula: Freight = Spot WS x 11.87

2. Arab Gulf netback

Quoin Island to Singapore: $ 10.77/mt plus $1.93/mt for the additional expense to the loading port (In this case, Mina al Ahmadi is used as a typical port). This yields a net freight cost of $12.70/mt. This amount of $/mt should be used for the AG freight netback calculation.

Formula: Freight = Spot WS x $12.70/mt

Gasoil/Jet/Kerosene freight methodology

Singapore - Arab Gulf netback calculations:

Quoin Island to Singapore base rate: $10.77/mt

Jubail to Quoin Island base rate (+port charges)	1.23+ 0.27 = 1.50
Bahrain to Quoin Island base rate:	1.57
Ras Tanura to Quoin Island base rate:	1.14+0.27=1.41
Mina al-Ahmadi to Quoin Island base rate:	1.93
	———————–
	6.41/ 4 = 1.60

AG to Singapore = Base rate Quoin Island to Singapore	10.77
Plus average of four-port discharge	1.60
Total:	$12.37/mt

Formula: Freight = Spot WS x12.37

For Gasoil LR2 netback:

Formula: Freight = Spot 80,000 mt WS x12.37

The final calculation is divided by 7.45 for gasoil and 7.9 for jet kero to convert $/mt into $/b.

Australian netback assessments

Base freight rate from Singapore to Melbourne/Sydney, Australia is $17.48/mt.

To obtain the actual freight Platts will determine the spot rate from Singapore to Australia times 17.48 and then the result will be divided by the conversion rate to convert $/mt into $/b.

1) C+F Australian Mogas:

Freight = Spot WS x 17.48/ 8.5

2) C+F Australia Gasoil:

Freight = Spot WS x 17.48 / 7.45

3) C+F Australia Jet:

Freight = Spot WS x 17.48/ 7.9

REVISION HISTORY

September 2019: Platts launched a FOB Singapore 95 RON gasoline cash differential assessment (price database code AGUMA00), and monthly average FOB Singapore 95 RON gasoline cash differential assessment (price database code AGUMA03). Platts also launched a new FOB Singapore 95 RON gasoline MOPS Strip (price database code AGUMS00), and monthly average FOB Singapore 95 RON gasoline MOPS Strip (price database code AGUMS03). In August 2019, Platts completed an annual review of this methodology guide. In this update, the cargo size for FOB China gasoline was amended, and the premium of 92 RON Unl gasoline FOB Arab Gulf to MOPAG gasoline was added to the table. The units of measurement were amended for South China jet fuel and LP gasoil, and MOPS West India gasoil netbacks in the table. The premium of 180 CST 2.0% sulfur fuel oil cargo against the 180 CST MOPS strip was removed as it was discontinued. The list of Gulf ports that are considered for inclusion in the oil products assessments is revised to state Sitra port instead of Bahrain, and Quoin Island is removed.

August 2019: Platts removed the vessel Marine Star (IMO 9002623) from the list of additional delivery points for the FOB Singapore fuel oil Market on Close assessment process on August 1, 2019.

July 2019: Platts updated the FSU FOB Singapore table to include the vessel CS Brilliance (IMO: 9153513) as an additional delivery point for the FOB Singapore high sulfur fuel oil Market on Close assessment process from July 17, 2019, and vessel operator for Energy Star. The LPG freight section has been moved to the global freight methodology guide. In the netback methodology section, Platts has amended the size of the LR2 freight rate listed for gasoil LR2 netback to 80,000 mt, from 75,000 mt.

July 2019: Platts updated the FOB Singapore gasoline specifications to reflect Reid Vapor Pressure at a maximum of 9.0 PSI, from the previous 9.5 PSI, final boiling point at maximum 215 degrees Celsius from a maximum of 225 degrees Celsius, and lowered the maximum sulfur content in all three gasoline grades to a maximum of 50 ppm (0.005%), from 350 ppm (0.035%) previously. In addition, because of the reduction of the sulfur content to a maximum of 50 ppm, the maximum aromatics content is set at 40%, while a maximum olefins content is set at 25% effective July 1, 2019. Platts also launched a FOB Singapore high sulfur 92 RON gasoline cash differential assessment (price database code PGAFY00), and monthly average FOB Singapore high sulfur 92 RON gasoline cash differential (price database code PGAFY03) on July 1, 2019. The Straits terminals list was updated to include Jurong Port Tank Terminals as a loading point in the Singapore MOC assessment process for gasoline starting July 1, 2019, and the change in names of two terminals at Tanjung Langsat to Dialog Terminals Langsat (1) Sdn Bhd (DTL1) and Dialog Terminals Langsat (2) Sdn Bhd (DTL2) from LgT-1 and LgT-2 respectively effective May 8, 2019, following a change in ownership structure.

May 2019: Platts removed several 10 ppm sulfur gasoil additives from the list of additives and added one lubricity additive. The vessels CS Innovation (IMO: 9158886) and CS Development (IMO: 9133850) were added to, and the Fortune Star (IMO: 9183374) was removed from the list of additional delivery points for the FOB Singapore fuel oil Market on Close assessment process. Platts has removed references to LSWR as the FOB Indonesia LSWR and FOB Indonesia LSWR Mixed/Cracked assessments were discontinued from April 1, 2019, and Platts has recommended a one-time differential of minus $3.50/b for FOB Indonesia LSWR and plus $1/b for FOB Indonesia LSWR Mixed/Cracked to Platts FOB Singapore Marine Fuel 0.5% that may be used in amending LSWR contracts which settle against Platts LSWR assessments after April 1, 2019. The specifications table for Marine Fuel 0.5% sulfur has been added. Platts has also updated the guide to include references to FOB Singapore and FOB Fujairah Marine Fuel 0.5% derivatives that were launched on May 2, 2019, and updated the fuel oil table.

April 2019: Platts added several new gasoil 10 ppm additives to the list of additives. Platts completed an annual update to sections 1 to 6 of Platts Methodology and Specifications Guides in April 2019, and moved these sections into a standalone Methodology Guide.

January 2019: Platts updated this guide to incorporate the 2019 freight netback calculations for all refined products, including the removal of the Shuaiba reference from the annual flat rate basket used for calculating the Arab Gulf to Japan naphtha netback assessments as well as an updated list of floating storage units reflected in its FOB Singapore fuel oil assessment process. Platts discontinued CFR South China 0.2% sulfur gasoil FOB Okinawa and C+F Japan gasoil assessments with effect from October 1, 2018. Effective January 2, 2019 Platts uses the Singapore-Australia 35kt clean MR freight assessments to calculate gasoline, gasoil and jet fuel CFR Australia netforward prices. Platts amended the cargo size reflected in its Middle East naphtha spot cargo differential assessment to 25,000-75,000 mt from the previous 25,000 mt, as of January 2, 2019. Platts added references to Marine Fuel 0.5% assessments launched on January 2, 2019. Platts amended fuel oil specifications to align them with ISO 8217:2010 standards reflected in Platts fuel oil assessments from January 2, 2019. Removed the tanker Speranza (now known as Hercules 1) (IMO:9002609) from the list of additional delivery points, as Platts no longer reflects loading from the vessel in FOB Singapore fuel oil assessments effective Jan 14, 2019.

September 2018: Platts completed an annual review of this methodology guide in September 2018, and made the following changes: Platts updated the nomination standards related to FOB Straits transactions after clarifying additional guidelines in a Subscriber Note published September 4, 2018; In the LPG section Platts removed references to previously discontinued assessments and also corrected an error in normalization basis for FOB East China assessment. In gasoline section, Platts added references to FOB Singapore 91 RON gasoline assessments that were launched in April 2018. In gasoil section, Platts added references to FOB Japan gasoil assessments launched in May, 2018. Platts also updated the guide to reflect

changes in the specifications of its LSWR (V-1250) assessments and differentials for LSWR Mixed/Cracked assessments. Platts added references to the tankers CS Prosperity, Grace Star, Marine Star that were included as additional delivery points in the FOB Singapore fuel oil MOC from August 2018; Removed reference to the tanker Amity Star from the list of additional delivery point, as Platts no longer reflects loading from the vessels in FOB Singapore fuel oil assessments effective May 27, 2018; Platts also added references to CFR South Africa assessments for clean products launched in August 2018. Platts has also revised Part I to Part VI of this guide. Following this revision Platts has moved the explanation of the MOPS and MOPAG Strips to Part VII of the guide. The revision also clarified that Platts no longer accepts Fax as a mode of communication for MOC participation. Platts also added a new section I to VI, and moved the explanation of the MOPS Strip to Section VII.

March 2018: Platts updated the guide to remove reference to FSU Jade Palms as Platts no longer reflects deliveries from the tanker in its FOB Singapore fuel oil assessments effective Feb 21, 2018. Platts also added new gasoil 10 ppm additives to the list of additives. Platts removed references to certain Taiwanese and Saudi Arabian posted bunker prices whose publication was discontinued March 1, 2018. CFR South Korea naphtha specifications were updated to reflect changes effective Oct 2, 2017 that raised the minimum paraffin level to 70% from the earlier 65%. Platts also removed guidance on bunkers from the guide as it has been moved to the Global Bunkers Guide.

January 2018: Platts updated this guide to reflect changes in the sulfur specification reflected in its Singapore, Arab Gulf, Korea and China gasoil assessments to a maximum of 10 ppm, effective January 2, 2018. Platts updated the 2018 freight netback calculations for all products. Platts also added reference to SCP Banyan facility's inclusion in the FOB Straits MOC process for gasoil and jet/kero assessments from November 1, 2017. Platts updated the list of additives reflected in 10ppm assessments to reflect two Baker Hughes additives. The update also removes reference to Hong Kong marine gasoil delivered bunker assessments that were discontinued November 1, 2017.

October 2017: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in September 2017: Platts updated the guide to added methodology descriptions for new delivered LSMGO and LSMDO assessments launched at Asian ports starting June 1, 2017. Platts updated the base freight rates for its Middle East product netback assessments to reflect a flat rate change for AG-Singapore naphtha and gasoil product routes. These updated rates were effective for netbacks published from May 3, 2017 onwards. The revision also added Platts decision to begin publishing offers of oil products from PT Oiltanking Karimun Terminal in Indonesia from July 3, 2017, and made edits for style and increased brevity to the FOB Straits section of this guide. Platts added a new gasoil 10 ppm additive to the list of additives. Platts added methodology descriptions for new MOPAG 92 RON cash differentials assessments launched on August 1, 2017. Platts clarified the maximum cargo size reflected in bids and offers for gasoline. Platts also updated the gasoline specifications reflected in its 92 RON and 95 RON cargoes loading in the Middle East. The update also reflects change in timestamp for Fujairah ex-wharf fuel oil assessments. Further, the update adds Jubilee Star to the list of approved FSUs reflected as additional delivery points in the Platts FOB Singapore fuel oil assessments. The update also reflects change to the CFR Japan naphtha and CFR South Korea naphtha specification. Platts updated jet fuel references to reflect Defence Standard 91-091 as defined by the UK Ministry of Defence and the Joint Fueling System Checklist, following an update to the numbering system used by UK Ministry of Defence and the Joint Fueling System Checklist.

March 2017: Platts updated this guide to add the newly launched FOB Fujairah 380 CST Fuel Oil ex-wharf assessment, and the discontinuation of Taiwan CPC's posted term prices for bunker fuels and publication of daily spot bunker prices by CPC. Platts also updated the unit of measurement for MOPS Strip naphtha from metric tons to barrels. Platts also updated the size of vessel for under its Middle East gasoline assessments from 30,000 mt to 35,000 mt.

January 2017: Platts added a new gasoil 10 ppm additive to the list of additives - Infineum R567K. Platts also updated the base freight rates for its Asian and Middle East product netback assessments to reflect published 2017 rates.

October 2016: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in October 2016: Platts updated the guide to added methodology descriptions for new assessments launched on October 3, 2016, reflecting independent outright values for gasoline, jet fuel, gasoil and fuel oil on a FOB Fujairah basis. Platts also added explanations for related MOPAG derivatives and MOPAG strips for these products. Platts updated the Worldscale flat basis rate used to calculate FOB Arab Gulf assessments for gasoil and jet/kerosene, following an announcement from the Worldscale Association on a Bahrain port tariffs increase. Platts updated the grade to add previously published clarifications that fuel oil delivered through the MOC assessment process should not include ULO. The guide was also updated to include FSUs that were approved as additional delivery points for fuel oil cargoes, and new bunker assessments for delivered bunker fuel at Busan, India and Sri Lanka. Platts added one new gasoil 10 ppm additive to the list of additives. Platts updated the gasoline specification to reflect Reid Vapor Pressure specification to a maximum of 9.5 PSI, from the current 10 PSI. Platts reduced the maximum benzene content from 5% currently to 2.5% volume and moved all three gasoline grades down to a maximum of 350 parts per million (0.035%), from 500 ppm (0.05%) previously. Platts also discontinued the assessments of FOB Singapore spot naphtha (under the code AAOVE00), FOB Singapore naphtha premium (under the code PAADC00), Monthly Average FOB Singapore spot naphtha (under the code AAOVE03) and Monthly average FOB Singapore naphtha premium (under the code AAFDE00).

March 2016: Platts updated a typographical error on naphtha Arab Gulf netback calculation. Platts also added four new gasoil

10 ppm additives to the list of additives.

January 2016: Platts updated this guide to incorporate the 2016 freight netback calculations for all products, as well as an updated list of floating storage units reflected in its FOB Singapore fuel oil assessment process.

December 2015: Platts updated this guide to incorporate new CFR Singapore naphtha assessments, which included a specification table contained in this methodology guide. Platts also added new additivities to the Platts gasoil additives list. Platts updated this guide to reflect approval of gasoil loadings from Power Seraya for inclusion in the FOB Straits. Platts completed reviews to include the Speranza and Jade Palms tankers as additional delivery points in its FOB Singapore fuel oil assessment process, Platts confirmed it would include the FSUs in its Market on Close assessment process with effect from September 25, 2015. Platts also updated its description of its MOC trade review process.

July 2015: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in July 2015. In this update, Platts reviewed all content. Platts updated guidance around how to report information and expectations for contactability. Platts also consolidated guidance regarding review of reported trades. In the specifications section of the guide, Platts updated this guide to reflect changes to its Singapore assessments for gasoline, jet fuel, gasoil and fuel oil through the FOB Straits price discovery process. Platts also updated the description of CFR Japan LPG and naphtha assessment cycles. Platts clarified its description of Aframax vessels in its fuel oil assessments. Platts clarified the language around post-deal tracking and "gapping." Platts also made minor typographical edits throughout.

May 2015: Platts updated this guide to reflect changes to Middle East premium assessments, the launch of Gasoil 10 ppm Middle East assessments, clarification around additives in Gasoil 10 ppm assessments and clarification around the Taiwan CPC posted bunker prices. This methodology guide was also updated to include further description of Platts' processes and practices in survey assessment environments. The guide was also updated to reflect changes to the Worldscale flat basis rate used to calculate FOB Arab Gulf assessments. Platts also made minor edits throughout.

December 2014: Platts updated this guide to incorporate changes to nomination procedures for terminals for FOB Singapore trades reflected in the MOC process. Platts also amended an error in the listing of volumes reflected by Singapore ex-wharf assessments. Platts updated the guide to include guidelines around trade of non-competitive bids and offers. And Platts updated the base freight rates for its Asian netback assessments to reflect published 2015 Worldscale rates.

November 2014: Platts updated this guide to incorporate standards for compensation expectations for late performance. Similar guidance had been present in methodologies published before August 2013.

September 2014: Platts updated this guide to reflect the discontinuation of spot premiums for second month loading for butane and propane FOB Middle East, and to reflect the amendment of the C+F Japan gasoil assessment to a specification of maximum 10 ppm sulfur. Platts removed an erroneous reference to a Singapore ex-wharf marine gasoil, which Platts does not assess.

June 2014: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in June 2014. In this update, Platts reviewed all content. The guide was updated to rename "Asia Proxy" as "Asia Strip" for LPG strip values; further clarify and differentiate Singapore's naphtha netback and spot naphtha assessment; incorporate published guidance around contaminants and FAME in Singapore gasoil assessments; break out definitions for gasoil assessments and netbacks in the Middle East; remove references to previously discontinued fuel oil assessments for China; indicate discontinued fuel oil assessments for South Korea and Japan; remove a reference to discontinued bunker fuel postings from Chimbusco; and remove a reference to Pasir Gudang in the bunker fuel assessment section. Platts consolidated guidelines around publishing information during the MOC assessment process into the MOC Data Publishing Principles section, and incorporated clarification guidance about how to express interest in bids and offers that were published in January 2014 and May 2014. Platts also made minor typographical edits throughout.

January 2014: Platts updated this guide to note changes to its bunker fuel assessment publication schedule; add 500CST bunker fuel specifications; note changes to Singapore gasoline specifications for distillation and density; changes to its Singapore 2% sulfur fuel oil assessment methodology; discontinuation of China fuel oil assessments; and the 2014 freight netback calculations for all products.

December 2013: Platts updated the units of measurement reflected for West India and the Middle East in the gasoline assessment definitions table contained in this methodology guide.

November 2013: Platts updated this guide, making minor edits through the text. Platts also noted plans to updates its methodology for 2% sulfur fuel oil in Singapore with effect from January 2014. Platts also noted plans to discontinue all China fuel oil assessments from January 2014. This update also notes a planned change to specifications reflected in Platts Singapore gasoline assessments from January 2014.

August 2013: Platts revamped all Oil Methodology And Specifications Guides, including its Asia Pacific & Middle East Refined Oil Products guide, in August 2013. This revamp was completed to enhance the clarity and usefulness of all guides, and to introduce greater consistency of layout and structure across all published methodology guides. Methodologies for market coverage were not changed through this revamp, unless specifically noted in the methodology guide itself.