

Infineum Marine Fuel Additives Product Catalogue



Performance you can rely on.





Our solutions to IMO 2020

Infineum has formulated a new range of marine fuel additives, **Infineum B Series**, designed to meet the challenges created by the International Maritime Organization (IMO) 2020 emission regulation changes.

A reduction of sulphur content in marine fuels from 3.5 to 0.5% in January 2020 could result in variable fuel quality across the globe as different approaches are taken to meet the new regulations.

Building on years of fuels technical expertise, Infineum B Series of additives has been developed for low sulphur fuels, addressing the challenges arising from variable fuel quality.

Infineum B Series additives are cost-effective solutions to help refiners, traders and blenders deliver robust, fit-for-purpose fuel solutions while helping vessel operators reduce maintenance costs and downtime, and improve engine efficiency.

The Infineum B Series works to address three key areas to ensure fuel stability:

Asphaltene
Management

Wax
Management

Lubricity
Management

Asphaltene management

Asphaltene deposition is a concern in Very Low Sulphur Fuel Oils (VLSFOs).

It has been observed that asphaltene deposition has become more prominent in VLSFOs due to the necessity of blending aromatic, high sulphur fuel components with paraffinic, low sulphur components in order to meet the IMO 2020 0.5% sulphur specification.

There are two vital aspects to consider:

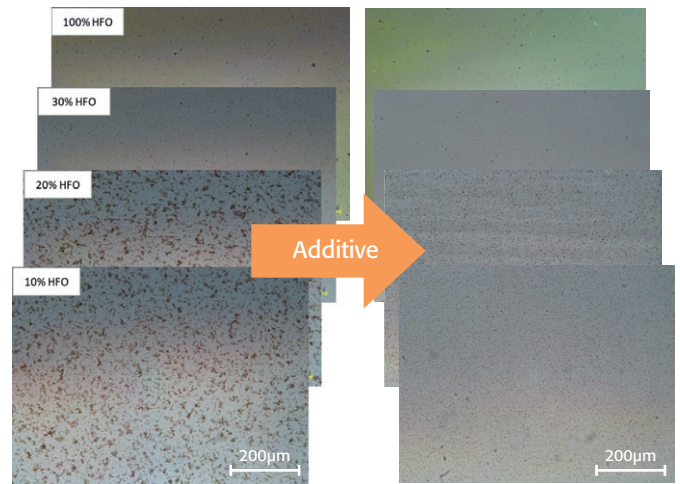
- Each fuel blend has to have its own intrinsic stability
- Each fuel should have a degree of compatibility with other fuels

How Infineum can help

Infineum asphaltene dispersant chemistry has been designed to address both aspects, enabling refiners/blenders to market the fuels they want, through broadening their fuel blend window, while offering trouble-free operation onboard ship.

Maximum benefit is achieved when Infineum asphaltene dispersant chemistry is treated into residual (asphaltene-containing) components prior to blending the finished fuel. However, the chemistry still offers significant benefits when employed as an aftertreatment additive.

Infineum marine fuel asphaltene chemistry has proven field performance in an extended ship trial and demonstrates unique capability to positively influence all of the suitable stability/compatibility test protocols referenced in CIMACs marine fuel handling guidelines. To find out about our full range of asphaltene management additives, please contact us at fuels.additives@infineum.com.



Microscope images showing the positive effect Infineum additives have on improving stability of Heavy Fuel Oil (HFO) and Marine Gas Oil (MGO) blends



Images show the improved fuel stability when using Infineum B Series asphaltene management chemistry

CIMAC marine fuel recommended test protocols

Total sediment (TSE, TSP, TSA)	Spot test	S-value	P-value	P-ratio
ISO8217 Total Sediment specification	Currently used on board stability test	Enhanced stability/compatibility test recommended by CIMAC		
ISO 10307 (ASTM D4870, IP 375/390)	ASTM D4740	ASTM D7157	ASTM D7112	ASTM D7060

Typical inspections and treat rates

	Infineum B201	Infineum B202
Properties Typical Values		
Appearance	Hazy liquid free from particulate matter	Hazy liquid free from particulate matter
Density @50°C	922 kg/m ³	916 kg/m ³
Flash Point	67°C	67°C
Kinematic Viscosity @20°C	17 cSt	18 cSt
Kinematic Viscosity @40°C	10 cSt	12cSt
Typical Performance in VLSFO and HFO (treat rates reported as ppm mass and ton of additive per ton of fuel)		
CIMAC recommended tests (see above)	1,000 to 4,000 ppm 1:1,000 to 1:250	1,000 to 4,000 ppm 1:1,000 to 1:250
Reserve Stability Number	100 ppm 1:10,000	100 ppm 1:10,000

Wax management

Low sulphur crudes tend to have higher paraffin content than higher sulphur crudes. As a result, lower sulphur marine fuels produced from low sulphur feedstock are likely to contain more wax.

As temperatures decrease, wax in the fuel drops out of solution and forms wax crystals. As the temperature reduces further, the crystals continue to grow and form lattice structures within the fuel, quickly gelling the fuel, known as the pour point. As little as 1% of wax out of solution can cause this to happen.

This can lead to fuel filter plugging, engine fuel starvation and solidification of wax in fuel storage tanks impacting the usage of such tanks.

Cold flow additives modify the wax crystal structures to reduce pour point and prevent rapid filter plugging and plugging of tank output screens.

How Infineum can help

With differences between wax distributions for MGO and VLSFOs, it is important that the right additive solution is chosen.

Infineum has a wide range of wax crystal modification additives, ensuring that whatever your requirements we have a solution for you. To find out about our full range of wax management additives, please contact us at fuels.additives@infineum.com.



Marine fuel treated with Infineum B Series

Typical inspections and treat rates

MGO PRODUCT RANGE	Infineum B111	Infineum B108
Properties Typical Values		
Appearance	Hazy liquid free from particulate matter	Hazy viscous liquid
Density @15°C	898 kg/m ³	916 kg/m ³
Flash Point	>62°C	>62°C
Kinematic Viscosity @40°C	17 cSt	775 cSt
Pour Point	-18°C	9°C
Typical Performance in MGO (treat rates reported as ppm mass and ton of additive per ton of fuel)		
CFPP (ASTM D6371) and pour point (ASTM D97)	50 to 500 ppm 1:20,000 to 1:2,000	50 to 500 ppm 1:20,000 to 1:2,000
Comment	Suitable for normal cloud point distillate grades	Suitable for high and normal cloud point distillate grades

Typical inspections and treat rates

VLSFO PRODUCT RANGE	Infineum B102	Infineum B105
Properties Typical Values		
Appearance	Off white waxy solid at 20°C	Hazy viscous liquid
Density @15°C	913 kg/m ³	908 kg/m ³
Flash Point	>62°C	>62°C
Kinematic Viscosity @50°C	65 cSt	75 cSt
Pour Point	27°C	12°C
Typical Performance in Heavy Fuel Oils (treat rates reported as ppm mass and ton of additive per ton of fuel)		
Pour Point (ASTM D97)	300 to 2,000 ppm 1:3,333 to 1:500	300 to 2,000 ppm 1:3,333 to 1:500
Comment	Suitable for VGO*, VLSFO and HFO grades	Suitable for VLSFO and HFO grades

*Vacuum Gas Oil

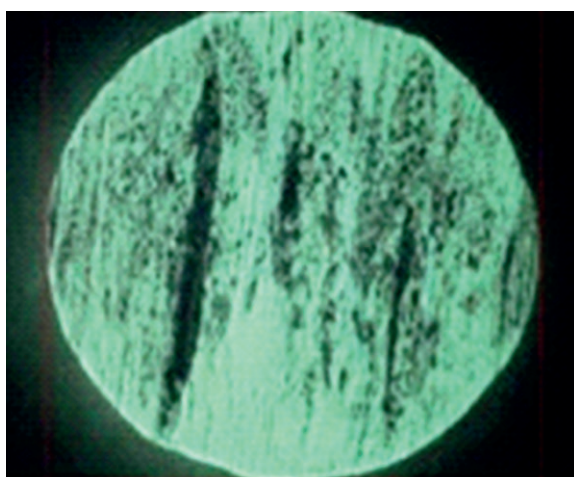
Lubricity management

Since IMO 2020 was announced it has been understood the move to lower sulphur fuels from Heavy Fuel Oil (HFO) could impact viscosity.

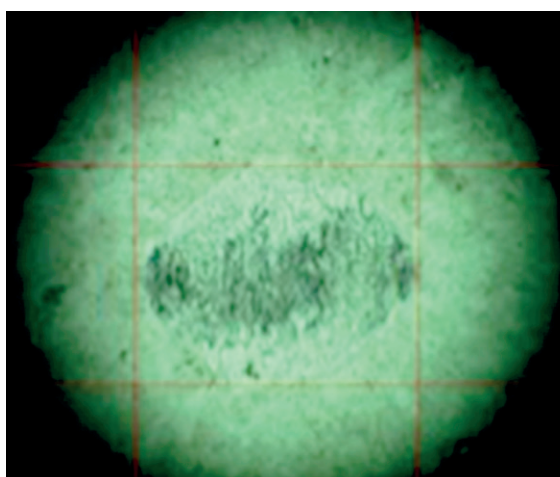
Increased use of Marine Gas Oil/Marine Diesel Oil grades and the move to blended VLSFOs will lead to a reduction in the viscosity of marine fuels relative to current high sulphur HFOs.

Lower viscosity fuels lead to worse lubrication and higher wear in critical high pressure fuel injection components.

Infineum lubricity additives have been tested under rigorous US Navy testing protocols.



UNTREATED



TREATED

Images show a typical wear scar of untreated low sulphur fuel in the High Frequency Reciprocating Rig test

How Infineum can help

Infineum lubricity additives are designed to reduce wear in mixed lubrication systems keeping engines working for longer. For your specific lubricity management requirements and to find out about our full range of additives, please contact us at fuels.additives@infineum.com.

Typical inspections and treat rates

Infineum R671	
Properties Typical Values	
Appearance	Pale liquid
Density @15°C	929 kg/m ³
Flash Point	>62°C
Kinematic Viscosity @40°C	6 cSt
Pour Point	-48°C
Typical Performance in MGO (treat rates reported as ppm mass and ton of additive per ton of fuel)	
HFRR (ASTM D6079)	100 to 400 ppm 1:10,000 to 1:2,500
Comment	Most widely approved lubricity improver and tested under rigorous US Navy testing protocols



About us

Infineum is a specialty chemicals company whose purpose is to create a sustainable future through innovative chemistry.

A joint venture between Shell and Exxon Mobil, Infineum is one of the world leaders in the formulation, manufacturing and marketing of petroleum additives for lubricants and fuels with operations and production facilities worldwide.

Delivering through powerful research and development capabilities around innovative chemistry, Infineum maintains its relentless focus on technology excellence, reliability, operational excellence and collaboration to deliver to customers *performance they can rely on.*



Infineum draws on a rich heritage that is underpinned by leading edge research and development activities. For nearly 80 years, we have been innovators of additive products, including those used in:

- Automotive, heavy-duty diesel and marine engine oils and fuels
- Diesel fuels
- Specialty applications such as transmission fluids and industrial oils

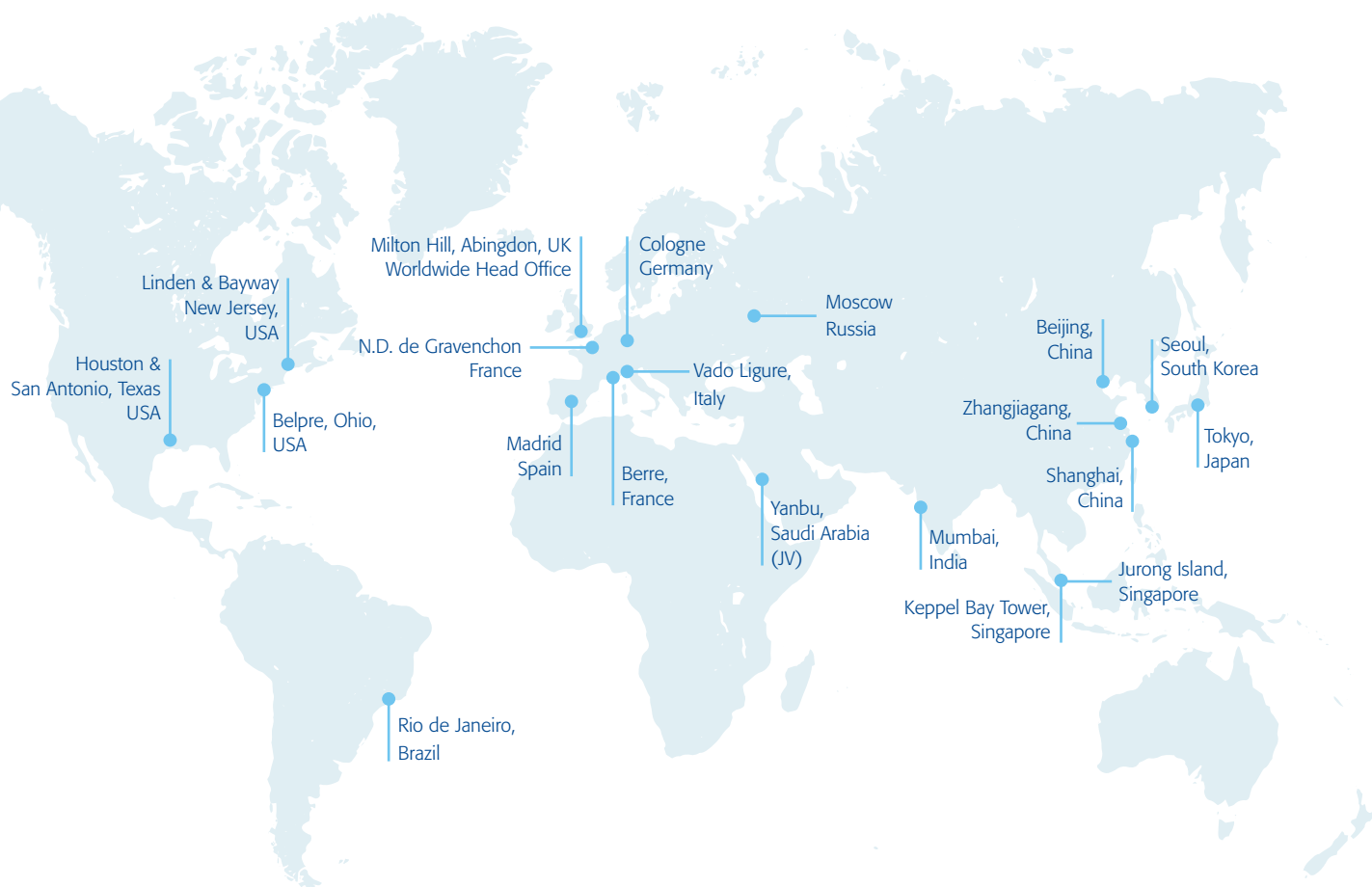
Our smart solutions have become key components of today's most demanding applications and advanced hardware systems.

Infineum is a truly world-class organisation.

Our global operations encompass:

- Worldwide production facilities
- Sales representation in more than 70 countries
- Business centres strategically located in the UK, USA, China and Singapore
- Business conducted in over 20 languages
- A global supply chain
- Multicultural business teams
- Over 2000 highly skilled and dedicated colleagues

Working with Infineum



To discuss your specific requirements and to find out more about our range of marine fuel additives please contact us at fuels.additives@infineum.com



infineum.com/marinefuels



infineuminsight.com/imo2020



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