

Fuel additives



Additives for use in
the formulation of high
performance fuels

Fuel additive components, designed to exceed today's demanding specifications

Additives play a progressively more critical role in the formulation of fuels to support the advances in gasoline and diesel engine technologies, the increased use of renewable and sustainable bio-fuels, and the requirement to reduce exhaust emissions.

As a global leading speciality component supplier of performance enhancing products, we supply an extensive range of products designed for use in the formulation of high performance fuels including:

- Diesel lubricity additives
- Asphaltene dispersants
- Organic friction modifiers (OFM's)
- Fuel dehazers
- Emulsifiers
- Corrosion inhibitors

Lubricity additives for diesel fuels

Legislation to reduce exhaust emissions has led to the development and use of low and ultra-low sulphur diesel fuels for automotive applications. During desulphurisation of the fuel not only are the undesirable sulphur compounds removed, but this process also results in the removal of other compounds that have lubricating properties.

Lubricity additives are necessary to protect the internal contact points in fuel pumps and injection systems in diesel engines. The addition of a lubricity additive is therefore an essential requirement in diesel fuel development.

Product name	HFRR wear scar* (µm)	Cloud point (°C)	Sulphur content (ppm)	Total acid number (mgKOH/g)	Demulsibility*
Ultra low sulphur diesel	638**	-7	<15	-	Good**
Perfad FA 3340	280	<-55	<10	<1	Good
Priolene 6907	387	7	<15	<203	Good
Priolube 1407	329	8	<15	<1	Acceptable

The data in this table represents typical properties.

*Diesel + 150ppm additive

**Reference diesel fuel – no additive

Perfad™ FA 3340 is specifically designed for use in cold temperatures and has the additional advantage of being effective at low treat-rates.

Emulsifiers

We recommend a range of surfactants to enable the emulsification of water-in-diesel and alcohol-in-diesel.

Product name	Physical form	Color	Flash point COC (°C)	Density at 25°C (g/cm ³)	HLB
Celevida 4500	Liquid	Dark brown	268	0.97	6
Pluvia S 85	Liquid	Amber	>149	0.95	1.8
Pluvia T 85	Liquid	Yellow brown	149	1.00	11

Data in this table represents typical properties.

Organic friction modifiers (OFMs) for gasoline fuels

With fuel economy continuing as a major global issue, friction modifiers can offer the potential to improve fuel efficiency by reducing friction inside the cylinder, consequently contributing to reduced CO₂ emissions. We recommend the following high performing products for use as organic friction modifiers for gasoline fuels.

Product name	Pour point (°C)	Iodine value (g/100g)	Cloud point (°C)	Hydroxyl value (mgKOH/g)
Optislip O	Pastille (melt point 69°C)	90	-	9
Priolube 1407	0	79	8	220
Perfad FM 3336	-25	5	12	204
Perfad FA 3340	-29	124	<-55	120

The data in this table represents typical properties.

Asphaltene dispersants

Applied in low concentrations, Kemelix 7475X is designed for both the prevention and remedial treatment of agglomeration and the subsequent precipitation of asphaltenes.

Kemelix 7475X is an oil soluble surfactant and has been developed to maximise production performance providing industry with significant tangible benefits including:

- Improved flow
- Reduced need for cleaning and deposit disposal
- Effective dispersion of existing deposits
- Reduced maintenance costs
- Increased production efficiency

Product name	Active content (%)	Dynamic viscosity at 25°C (mPa.s)	Density at 25°C (g/cm ³)	Pour point (°C)	Flash point PMCC (°C)
Kemelix 7475X	66	7,480	0.91	3	>200

Data in this table represents typical properties.

Dehazers

Water contamination in fuel can be a major problem. The inclusion of surface active compounds in the fuel can lead to the formation of emulsions, often described as haziness of the fuel.

To prevent this problem occurring, demulsifiers, or dehazers, can be added to the fuel which results in water separation. The dehazer lowers the interfacial tension of the emulsion allowing coalescence of the water droplets in order to accelerate the settling of water, resulting in a clean bright fuel.

Our unique range of Kemelix™ products are proven to effectively treat fuel, promoting rapid water separation. These products are designed with the additional value of low treat rate use, and can provide the following benefits to industry formulators:

- Reduced tank settling period
- Reduced need for filtering and reprocessing
- Improved operational efficiency
- Prevention of hazing problems across the supply chain
- Protection against corrosion

Product name	Physical form	Active content (%)	RSN*	pH (1% in 85/15 m/m IPA in water)	Cloud point (°C)	Flash point PMCC (°C)	Density at 25°C (g/cm ³)
Kemelix 3422X	Liquid	100	7	8.0	13	>100	1.00
Kemelix 3535X	Liquid	75	18	9.0	50	64	1.03
Kemelix D310	Liquid	88	16	7.0	53	64	1.03
Kemelix D311	Liquid	80	17	6.5	58	64	1.00
Kemelix D317	Liquid	80	9	7.5	33	63	1.00
Kemelix D400	Liquid	80	7	8.5	<20	30	0.98
Kemelix D510	Liquid	100	12	7.5	50	>100	1.02
Kemelix D511	Liquid	100	17	10.0	87	>100	1.02
Kemelix D513	Liquid	100	7	7.5	34	>100	1.00

The data in this table represents typical properties.

*RSN - Relative Solubility Number

The RSN test method determines the hydrophile-lipophile balance of the specific product under test by means of water titration.

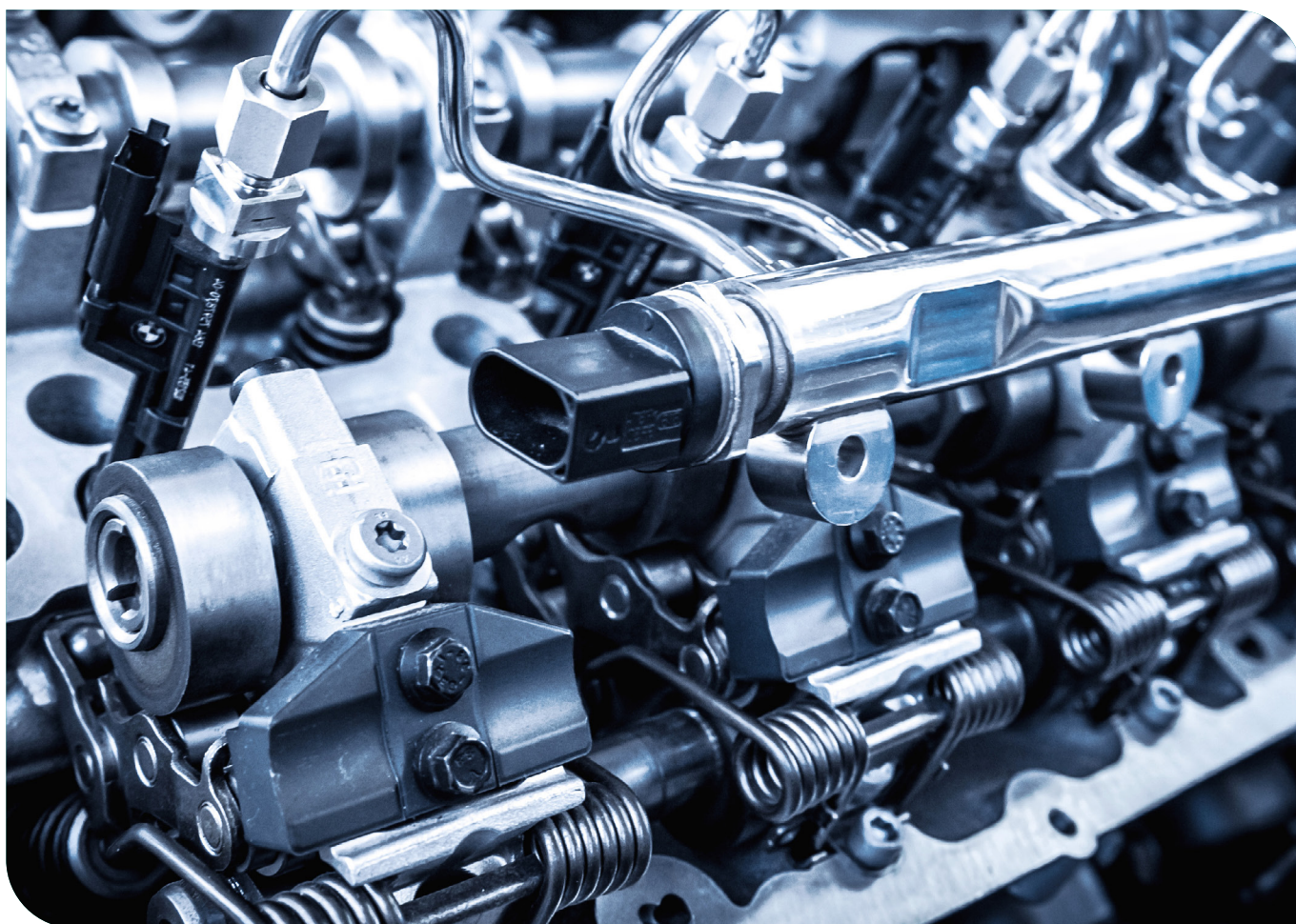
The RSN is the volume in millilitres of water necessary to produce a persistent turbidity in a given solvent system. All values quoted are determined with solvent stripped demulsifier. In general, products with an RSN <13 are insoluble in water, products with an RSN 13-17 are water dispersible, and products with an RSN >17 are soluble in water.

Corrosion inhibition additives

Our range of effective anti-corrosion agents are suitable for use in the prevention of corrosion and wear in fuel tanks and fuel injection equipment. These additives provide protection in diesel, gasoline and gasoline/ethanol blends at low treat-rates (<10ppm).

Product name	Physical form	Acid value (mgKOH/g)	Flash point COC (°C)	Dynamic viscosity at 25°C (mPa.s)
Pripol 1017	Liquid	193	275	8,000
Pripol 1025	Liquid	194	275	8,900
Pripol 1040	Liquid	189	320	45,000
Pripol 1252	Liquid	188	275	2,500

The data in this table represents typical properties.



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Who are we?

The Energy Technologies business in Cargill Bioindustrial creates, makes and sells specialty chemicals and additives for the global energy market. Working in close collaboration with our customers, we apply sustainable concepts and deep scientific expertise so that together we can efficiently power the world of tomorrow.

At our core, we are experts in synthetic ester and polyalkylene glycol chemistries, taking products from lab scale through to full manufacturing. Investing in the development of new chemistries allows us to support our customers in meeting new industry challenges.

For those who dare to imagine a brighter future, we establish long lasting relationships and create bespoke industry solutions through our integrated research & development and global manufacturing capabilities. Being both global and local, you have direct access to our network of technical experts. We look forward to talking to you.

Further information

Cargill Bioindustrial sales and distribution are coordinated through an extensive worldwide network of technical and commercial experts. For further information or guidance please contact us:

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