

Fuel additive technology suite

Increase fuel value and address safety concerns

Maximizing profitability while making fuels has always been tough, and increased regulations make it harder than ever. In addition, markets have become complex and competitive and customers need every advantage.

As a long-time technology leader in the industry, Baker Hughes has a dynamic suite of technologies to help combat fuel problems, including **TOLAD™ fuel additives**, **SULFIX™ hydrogen sulfide (H₂S)** and mercaptan scavengers, and **BIOQUEST™ renewable fuel additive solutions**.

Baker Hughes technology experts have extensive application knowledge and in the field training. They can accurately diagnose customer needs and hydrocarbon issues and apply the appropriate program in a safe and economical manner.

The Baker Hughes portfolio of performance additives are part of the critical building blocks used by the aftermarket and other specialty fuel additive manufacturers to create industry leading multifunctional additive packages for use in the fuel

and lubricating oil space. The Baker Hughes suite of fuel additives provide formulators with a broad selection of proprietary products that deliver unrivalled performance. The inclusion of Baker Hughes branded fuel additives enables our customers to capture and demonstrate differential package performance, minimize negative interaction concerns while maintaining package integrity and quality.

Whether importing or exporting, in a refinery or a distributions system, there are defined fuel quality specifications to be met. Baker Hughes have fuel additives that reduce fuel injector deposits, enhance lubricity, improve stability, control corrosion, and mitigate water entrainment.

The Baker Hughes fuel additive technology suite can increase the profitability, enhance quality, and ensure availability and reliability of fuels.

Contact Baker Hughes for more information on how the fuel additive suite can increase fuel values.

Applications

- Aftermarket fuel packages
- Biofuels and finished fuels
- Refineries and terminal
- Pipelines

Benefits

- TOLAD cold flow additives
 - Improve low-temp operability
 - Decrease filter plugging
- TOLAD dehazers and demulsifiers
 - Eliminate water haze from fuels
- TOLAD conductivity improvers
 - Increase the electrical conductivity
 - Reduce the electrostatic hazards
- TOLAD cetane improver
 - Improves diesel combustion and enhances fuel quality
 - Reduces ignition delay
- TOLAD corrosion inhibitors
 - Meet corrosion specifications for both ferrous and non-ferrous metals
- TOLAD lubricity improvers
 - Restore lubricating properties of hydrotreated diesel fuels
 - Reduce failure of fuel pumps and injectors
- SULFIX H₂S and mercaptan scavengers
 - Address HSE concerns and industry regulations
- BIOQUEST renewable fuel additives
 - Improves quality of renewable or low carbon fuels and feedstocks
 - Fit for use in traditional petroleum based fuels and feedstocks

Challenges					Baker Hughes additives	Benefits gained
	Feedstock	Marine fuel	Intermediate products	Refined products		
<ul style="list-style-type: none"> Gelled fuel Reduced flow Filter plugging Blocked lines 					<ul style="list-style-type: none"> TOLAD™ operability additives (CFPP, LTFT) TOLAD pour point depressants TOLAD cloud point depressants 	<ul style="list-style-type: none"> Improve flow characteristics in cold weather Permits blending of higher pour materials Improve low temperature vehicle operability Lower cloud point and pour point
<ul style="list-style-type: none"> Electrical charge build-up in fuel due to movement and pumping with the potential for static discharge and explosion 					<ul style="list-style-type: none"> TOLAD conductivity improvers 	<ul style="list-style-type: none"> Increase electrical conductivity of hydrocarbon liquid Enhance safety during handling, loading, and transport of fuels Meet industry conductivity specification for diesel fuel
<ul style="list-style-type: none"> Hazy fuel caused by finely dispersed water droplets or an emulsion Diminished water shedding properties of a fuel resulting from surfactants present in an additive package 					<ul style="list-style-type: none"> TOLAD dehazers TOLAD demulsifiers 	<ul style="list-style-type: none"> Clear, marketable fuel Reduced microbiological growth Reduced potential for corrosion
<ul style="list-style-type: none"> Poor fuel lubricity 					<ul style="list-style-type: none"> TOLAD lubricity additives 	<ul style="list-style-type: none"> Reduce wear within engine and fuel injection system Meet industry specification
<ul style="list-style-type: none"> Premium or exported diesel fuel 					<ul style="list-style-type: none"> TOLAD multi-purpose additive packages 	<ul style="list-style-type: none"> Exceed standard fuel specifications Premium fuel marketability claims
<ul style="list-style-type: none"> Failing copper and/or silver strip corrosion tests 					<ul style="list-style-type: none"> TOLAD non-ferrous corrosion inhibitors 	<ul style="list-style-type: none"> Meet fuel specifications Inhibit corrosion to non-ferrous metal
<ul style="list-style-type: none"> Hydrocarbons which cannot be moved due to: <ul style="list-style-type: none"> High pour point Solidification Wax deposition Reduced pumping rate 					<ul style="list-style-type: none"> TOLAD heavy oil pour point depressants Paraffin control additives 	<ul style="list-style-type: none"> Enable transportation of waxy crudes and fuels Reduce the need for system heating Reduce the need for higher value cutter stock Enhance the value of heavy fuels Better handling of opportunity crudes
<ul style="list-style-type: none"> Rusting of pipelines or fuel systems resulting in corrosion-based failures Increased particulates Plugged filters Rough pipe walls 					<ul style="list-style-type: none"> TOLAD corrosion inhibitors 	<ul style="list-style-type: none"> Improve pipeline integrity Decrease corrosion of carbon steel equipment Reduce filter plugging Decrease pumping costs
<ul style="list-style-type: none"> Fuel instability causing filter and fuel line plugging and injector and burner fouling 					<ul style="list-style-type: none"> TOLAD stability additives 	<ul style="list-style-type: none"> Inhibit degradation in fuel and suppress residue formation Reduce deposits and filter plugging Allow for flexibility of blend components Improves longer fuel storage
<ul style="list-style-type: none"> Increased instability due to the presence of metals such as copper, vanadium, and iron 					<ul style="list-style-type: none"> TOLAD metal deactivators 	<ul style="list-style-type: none"> Catalytic metals are chemically deactivated Improve stability
<ul style="list-style-type: none"> Poor ignition quality in diesel White smoke Difficult starting Rough idle 					<ul style="list-style-type: none"> TOLAD cetane improvers TOLAD multi-purpose diesel additives 	<ul style="list-style-type: none"> Improve combustion efficiency Better starting characteristics in cold weather Reduce emissions Permits increased blending of lower cetane stocks
<ul style="list-style-type: none"> Presence of toxic H₂S Corrosion Emissions control 					<ul style="list-style-type: none"> SULFIX™ H₂S scavengers 	<ul style="list-style-type: none"> Improve safety, minimizing employee exposure to H₂S Reduce toxic emissions Minimize the number of product rejections Decrease demurrage Reduce storage corrosion
<ul style="list-style-type: none"> Presence of mercaptans Corrosion Failed doctor test Odor problems 					<ul style="list-style-type: none"> SULFIX mercaptan scavengers 	<ul style="list-style-type: none"> Improve product quality Reduce odor complaints Improve corrosion characteristics
<ul style="list-style-type: none"> Hydrocarbon has an objectionable odor 					<ul style="list-style-type: none"> SULFIX hydrogen sulfide and mercaptan scavengers Odor abatement chemicals 	<ul style="list-style-type: none"> Mitigation of H₂S and mercaptans Acceptable fuel odor
<ul style="list-style-type: none"> Renewable fuel and blending 					<ul style="list-style-type: none"> BIOQUEST™ renewable fuel additives 	<ul style="list-style-type: none"> Inhibit degradation in fuel and suppress residue formation Prevent corrosion and build-up of biomass and plugging of filters and gauges Reduce wear within engine Improve pipeline integrity management Unique patented non-metallic formulation to increase conductivity and meet industry safety standards
<ul style="list-style-type: none"> Fouling in fuel distribution system Fouling in burners Fouling of combustion chamber and exhaust chamber 					<ul style="list-style-type: none"> ALCHEMIA™ ash reduction additives and services 	<ul style="list-style-type: none"> More efficient combustion Less maintenance of fuel system Increase reliability of equipment
<ul style="list-style-type: none"> Slime and solids in fuel storage Plugged filters and fouled instrumentation Emulsion problems Corrosion Elastomer breakdown 					<ul style="list-style-type: none"> X-CIDE™ biocides (water- or fuel-soluble) 	<ul style="list-style-type: none"> Decrease plugging of filters and injection equipment Improve water shedding characteristics Reduce storage tank corrosion

■ Feedstock
■ Fuel oil and bunkers (marine fuel)
■ Intermediate products
■ Refined products

