



Drilling and completion chemical solutions



Oilfield applications

Nouryon

Oilfield solutions: A wellspring for sustainable success now and in the future

We are continuously innovating to deliver solutions that satisfy the evolving demands of our oilfield customers.

Tap into decades of global oilfield experience, an internationally integrated supply chain, and a dedicated customer support team to achieve high performing oilfield solutions.

Combining a wealth of expertise with an innovative portfolio, we provide you with the tried-and-tested and custom solutions you need to enhance your drilling, production, stimulation, cementing, and cleaning processes.

With a strong understanding of the growing challenges you face, our Oilfield experts are committed to solving your problems and driving performance in a sustainable way.

Our Oilfield product range features solutions that:

- Add value to oil production in a cost-efficient and sustainable manner by improving water-oil separation processes
- Focus on critical flow assurance issues in oil and gas production
- Help customers develop high-performance oil and water-based drilling formulations
- Address a wide range of stimulation applications
- Act as dispersants, retarder additives, and rheology stabilizers
- Provide support in oilfield cleaning applications like degreasing rig equipment, well-bore cleanup, cuttings cleaning, and removing screen blockage

To learn more about how we can help you, please contact us: oilfield@nouryon.com



Drilling and completion solutions

Our range of surfactant, cellulose, and polymer-based additives help drilling and completion engineers develop high-performance and standard oil- and water-based drilling mud formulations.

Specialized drilling fluid chemistries

- Suspend and lift cuttings out of the well
- Control formation pressure
- Seal permeable formations
- Maintain wellbore stability
- Cool and lubricate drill bits
- Minimize formation damage
- Reduce environmental impact
- Clean drilling equipment

Our research team continues to develop novel products that address the key challenges facing the drilling industry today

Water-based mud additives

Water-based drilling muds (WBM) have always been desirable due to their low cost and the availability of the water used to make up the fluid. Although considered the fluid of choice in environmentally sensitive locations, applications which are technically challenging for WBM include fluid loss, stabilizing shales and poor rheological control at high temperatures.

To help our customers overcome these challenges, we offer a portfolio of additives that can be used to extend the performance for this type of drilling fluid. Our water-soluble polymers in particular are effective deflocculants – stabilizing the fluid rheology as temperature and pressure conditions change.

Oil-based mud additives

Oil-based drilling muds (OBM) have been preferred by the industry for decades due to their effective fluid loss control, shale inhibition properties and drill-bit lubrication – especially at higher temperatures.

To help formulators develop OBM for a variety of field conditions, we provide a wide range of additive solutions. Many of these functional additives are components that can be built into the emulsifier package, which stabilizes the internal aqueous phase, develops fluid rheology and prevents fluid loss.

Water-based mud additives

Function	Chemistry	Recommended products	Key attributes	Appearance
Deflocculant/ Dispersant	Sulfonated copolymer	Narlex® D72	High temperature deflocculant and dispersion	Powder
	Sulfonated polystyrene	Versa-TL® 130	High temperature stability, brine stability	Liquid
Viscosifier/ Fluid loss additive	Carboxy methyl cellulose (CMC)	Gabroil® CMC LVT	Technical grade CMC (low viscosity)	Powder
	Polyanionic cellulose (PAC)	Staflo® HV Staflo® LV	Purified PAC (high viscosity) Purified PAC (low viscosity)	Powder Powder
Friction reduction	VES-Tallow amidoamine oxide	Aromox® APA-TW	Non-damaging viscosifier for work-over and completion brines. Can be used as spacer and for zonal isolation (<250°F).	Liquid
	VES-Zwitterionic surfactant	Armovis® EHS	Non-damaging viscosifier for work-over and completion brines. Can be used as spacer and for zonal isolation (<350°F).	Liquid
Rheology modification	Sulfonated polystyrene	Versa-TL® 502	Secondary rheology control at high temperature without viscosification	Powder
Biocide	Benzalkonium chloride	Arquad® MCB	EU BPR supported	Liquid
		Arquad® 2.10-50 Arquad® 2.10-80	EU BPR supported US EPA approval expected H2/2022	Liquid Liquid
Corrosion inhibitor	Imidazoline	Armohib® CI-209 (US)/ Armohib® CI-219 (EU)	Allround multi-purpose imidazoline for use as corrosion inhibitors in WBM	Liquid
	Oligomeric ester amine	Armohib® CI-5174	Polymeric CI for sweet and sour corrosion. Good brine tolerance.	Liquid

Oil-based mud additives

Function	Chemistry	Recommended products	Key attributes	Appearance
Primary emulsifier	Alkanolamide	Amadol® 511 (US)/ Witcamide® 511 (EU)	Additives to formulate oil-based mud as dispersant, emulsifier and wetting agent	Liquid
Rheology modification	Dialkyl quaternary compounds	Arquad® 2HT-75, Arquad® 2HT-85, Arquad® M2HTB-83E, Arquad® 268-75E, Arquad® 218 I	High temperature stability, brine stability	Liquid
Wetter/ Emulsifier	Imidazoline	Armohib® CI-209 (US)/ Armohib® CI-219 (EU)	High-end imidazolines for use as wetting agents in oil-based muds	Liquid
	Calcium salt of branched DDBSA	Witconate® P-1220EH	Wetting agent and thinner for SBM/OBM. Also works well as a emulsifier	Liquid

Oilfield cleaners

Cleaners are critical in achieving performance requirements in diverse applications such as cleaning and degreasing of all kinds of rig equipment, tank cleaning, drill-cuttings cleaning, cement-spacer cleaning, wellbore-cleaning spacer systems, removal of screen blockage and wellbore emulsions, reservoir rock cleaning, and reservoir wettability changes.

We have a long history of producing highly efficient surfactant-based cleaning products for a variety of markets – these are sold in oilfield under the Armoclean brand. With our extensive testing and research, we can help by providing effective formulations to suit a diverse range of applications at challenging temperatures, pressures, and high-salinity environments.

Function	Chemistry	Recommended products	Key attributes	Appearance	
Emulsifier	Oleyl monoethanolamide	Armoclean® 3000	Excellent emulsifying properties combined with low foam	Liquid	
Cleaning and wetting agent	Alcohol and quat alkoxyolate	Armoclean® 1000	Optimized surfactant blend intended for use in water based alkaline and acid cleaners	Liquid	
		Armoclean® 1025	Optimized cationic surfactant blend based on ethoxylated quat	Liquid	
		Armoclean® 1100	Optimized nonionic surfactant blend for offshore cleaning	Liquid	
		Armoclean® 4100	Low-foam cleaning and degreasing for mud, tanks, cuttings	Liquid	
		Armoclean® 4150	Low-foam wetting for mud, tanks, cuttings	Liquid	
		Armoclean® 4200	Nonionic surfactant based on a synthetic primary alcohol	Liquid	
		Armoclean® 4350	For water and solvent based casing cleaning. Low foam, excellent wetting performance and low surface tension. OSPAR compliant.	Liquid	
		Armoclean® 4380	Casing cleaning, medium foam. OSPAR compliant.	Liquid	
		Alkyl glucoside	Armoclean® 6000	Strong solubilizer. Excellent brine tolerance. Very high temperature insensitivity. Low foam. OSPAR compliant.	Liquid
			Armoclean® 6040	Our strongest solubilizer, with the best brine tolerance. Very high temperature insensitivity. Low foam. OSPAR compliant.	Liquid
Armoclean® 6060	Cleaner with very high brine tolerance and electrolyte stability. High foam dispersant.		Liquid		
Hydrotrope	Quaternary ammonium compound	Armoclean® 6250	Multi-functional cosurfactant - excellent hydrotrope, de-greasing booster, effective at very low concentrations. Acid stable and dispersing.	Liquid	
Dispersant	Water-soluble polycarboxylate	Alcoflow® 300	High temperature stability, high brine tolerance	Liquid	
		Alcoflow® 880	Very high brine tolerance and electrolyte stability. OSPAR compliant.	Liquid	
		Alcosperse® 747	Compatible in liquid formulations with high amounts of surfactants and disperses both hydrophilic and hydrophobic substrates	Liquid	

Cementing and Completion additives

Cementing a well is essential to maintaining production quality and well integrity. The cement slurry must be low viscosity for pumping and must not begin to set before being placed in the desired location, even as the temperature rises. However, it should set with high strength as soon as possible after placement.

Our Versa-TL®, Aquatreat®, Narlex® and Alcodrill® products act as retarders and cement rheology stabilizers and are particularly effective at elevated temperatures. These additives can also prevent fluid loss and decrease need for gas migration control additives when formulated. To learn more about our work done on biodegradable cement retarders, contact us.

Function	Chemistry	Recommended products	Key attributes	Appearance
Dispersant	Sulfonated polystyrene	Versa-TL® 130	High temperature stability, brine stability	Liquid
Retarder	Proprietary sulfonated copolymer	Aquatreat® AR-540 Dry	Medium temperature retarder	Powder
	Sulfonated styrene maleic acid copolymer	Narlex® D-72	High temperature retarder, brine stability	Powder
	Proprietary sulfonated copolymer	Alcodrill® CR-100	Provides early compressive strength on setting	Powder

After drilling, effective removal of filter-cake is crucial to guarantee enough cement bond and sealing capacity behind casing. Also, open-hole completions rely in filter-cake to be fully eliminated to allow fluid flow into the well. Our aminopolycarboxylic acids induce slow dissolution of filter-cake solids for homogeneous clean-up, even when challenging materials like Barite are present.

In addition, our viscoelastic surfactants (VES) can be used to tailor completion fluids in a wide range of brine compositions to facilitate the viscosity needed in your completion operations; our VES are free of damaging additives that could hinder well deliverability once in production phase.

Function	Chemistry	Recommended products	Key attributes	Appearance
Viscosifier	Tallow aminoamine oxide	Aromox® APA-TW	Non-damaging VES for mid-temperature (<250°F) completions operations	Liquid
	Zwitterionic surfactant	Armovis® EHS	Non-damaging VES for high-temperature (>250°F) completions operations	Liquid
Filter-cake dissolver aid	Aminopolycarboxylic acids	Dissolvine® H-Na-40	Dissolver of carbonate-based weighting agents for filter-cake cleaning	Liquid
		Dissolvine® StimWell™ HTF	OSPAR compliant dissolver to aid the removal of carbonate-based filter-cake	Liquid
		Dissolvine® StimWell™ DDH	Dissolver to remove challenging barite and sulphate based filter-cake	Liquid

Contact us for more details
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Nouryon

Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of more than 7,900 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands. Visit our website and follow us @Nouryon and on LinkedIn.

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