



Environmentally responsible oilfield solutions

Nouryon

World-class customer productivity empowered by innovative oilfield chemistries



General characteristics										Solubility			Functionality				Environmental and regulatory status				
Product name	Chemistry	Primary use	Active content	Physical form	CMC g/l	Surface tension mN/m	Pour point °C	Flash point °C	Viscosity mPas (°C)	Water	IPA	Aromatic	Foaming	Brine tolerance	Interfacial tension mN/m	Wetting	OECD 306	CEFAS classification	Norway classification	WGK	REACH compliant
Armoclean® 4350	Alcohol alkoxylate	Cleaner, wetting agent	100%	liquid	1.1	26.5	-9	>100	30 (20)	D	S	S	L	M	1.2	29	>60%	No substitution warning	Yellow 0	1	Yes
Armoclean® 4380	Alcohol alkoxylate	Cleaner, wetting agent, emulsifier	100%	liquid	1.6	29	12	>100	70 (20)	S	S	S	M	H	4.2	52	>60%*	No substitution warning	Yellow 1	1	Yes
Armoclean® 4400	Fatty acid ethoxylate	Cleaner, emulsifier, dispersant	100%	liquid	0.4	39	4	>100	800 (20)	S	S	S	M	M	4.8	72	>60%	No substitution warning	Yellow 0	1	Yes
Armoclean® 6000	Alkyl glucoside	Hydrotrope, cleaner, wetting agent	65%	liquid	14	33.4	ND	>100	160 (30)	S	I	I	L	H	12.8	78	>60%	No substitution warning	Yellow 0	1	Yes
Armoclean® 6040	Alkyl glucoside	Hydrotrope, cleaner	75%	liquid	30	34	-9	>100	775 (20)	D	I	I	L	H	7.1	87	>60%	No substitution warning	Yellow 0	1	Yes
Armohib® CI-5148	Oligomeric ester amine	Corrosion inhibitor	100%	liquid	ND	ND	< -18	>100	525 (20)	D	S	S	L	M	ND	ND	>60%	No substitution warning	Yellow 0	ND	Yes
Armohib® CI-5150	Oligomeric ester quat	Corrosion inhibitor	55%	liquid	0.01	31	-5	90-94	3500 (20)	S	S	S	M	H	ND	ND	>60%	No substitution warning	Yellow 0	1	Yes
StimWell™ HTF	Aminopolycarboxylic acid	Acidizing fluid and scale dissolver (CaCO ₃ , Fe-based)	36%	liquid	ND	ND	-12	>100	13 (20)	S	ND	I	ND	H	ND	ND	>20%	No substitution warning	Yellow 1	1	Yes
StimWell™ DGH	Aminopolycarboxylic acid	Scale dissolver (CaSO ₄)	47%	liquid	ND	ND	-15	>100	<250 (20)	S	ND	I	ND	H	ND	ND	>20%	No substitution warning	Yellow 1	1	Yes
Witbreak™ NEO-110	Glycol polyester	Demulsifier	80%	liquid	ND	ND	< -20	>100	761 (20)	I	I	S	ND	M	ND	ND	>60%	No substitution warning	Yellow 0	ND	Yes
Witbreak™ NEO-120	Glycol polyester	Demulsifier	80%	liquid	ND	ND	< -20	>100	1154 (20)	I	I	S	ND	M	ND	ND	>20%	No substitution warning	Yellow 1	ND	Yes
Witbreak™ NEO-130	Glycol polyester	Demulsifier	100%	liquid	ND	ND	< -14	>100	1749 (20)	I	I	S	ND	M	ND	ND	>60%	No substitution warning	Yellow 0	ND	Yes

Surface Tension acc. to Du Nouy, 0.1%

Solubility: S=Soluble; D=Dispersible; I=Insoluble

Foaming: L=Low; M=Medium; H=High; ND=Not Determined
 Brine tolerance: M=Medium; H=High
 IFT: product in 3.5% NaCl / North Sea crude
 Wetting: Contact angle 0.1% hydrophobic surface

*OECD 301D

German Water Hazard Classification

Armoclean 4350 is a highly surface active nonionic surfactant with features relevant to multiple oilfield applications. It is suitable for cleaning and stimulation operations due to the low surface tension, excellent wetting, and low foam and odour. Also proven to be a powerful component in non-emulsifier formulations. Although not fully water soluble in itself, significant brine and temperature stability is gained when formulated with compatibility agents such as Armoclean 6000 or 6040.

Armoclean 4380 is a more hydrophilic version of Armoclean 4350 that is water soluble with increased emulsifying properties. It also maintains a strong wetting performance, such as for sandstone. Blending with Armoclean 4350 often gives clear synergy in formulations for various applications like casing cleaning.

Armoclean 4400 is a powerful emulsifier with a natural raw material-based hydrophobic part. The product performs effectively both alone and when blended with Armoclean 4350/4380. For instance, when combined with Armoclean 4350 in cold degreaser formulations containing fatty acid methyl esters, it can successfully replace traditional harmful solvent-based cleaners in various rig cleaning operations. In addition, Armoclean 4400 is an effective dispersant for various applications, including prevention of asphaltene agglomeration.

Armoclean 6000 has strong solubilizing/hydrotrope properties while also being low foaming and highly salt/brine tolerant. The sugar based hydrophilic part of this product makes it insensitive to temperature changes unlike many other nonionic surfactants. With a somewhat longer hydrophobic tail, Armoclean 6000 is slightly more surface active than 6040.

Armoclean 6040 is a high performance hydrotrope/compatibility agent with extreme brine and temperature tolerance. It can help less compatible chemistries perform under challenging oilfield conditions and can be used in several applications, such as cleaning, corrosion inhibition, wetting agents, and non-emulsifier formulations. Other key properties are low foam and temperature insensitivity.

Armohib CI-5148 is our prime corrosion inhibitor when it comes to environmental properties, demonstrating very low aquatotoxicity combined with excellent biodegradation and no-bioaccumulation classification. Supplied as an easy-to-handle 100% active oligo-amine base, solubility and partitioning properties can be easily tuned by adding an acid, and it can be recommended for multiple applications including sweet corrosion and pipelines.

Armohib CI-5150 is a high-performance, patented corrosion inhibitor featuring multiple binding sites to the steel surface. In addition to being extremely easy to formulate due to its very broad solubility profile, it has a superb brine tolerance even at elevated temperatures, thus it is suitable for use even in completion brines. It is fully North Sea compliant and shows aqua toxicity values 10-100 times better than standard corrosion inhibitor chemistries such as imidazolines and benzyl quats. Armohib CI-5150 is non-emulsifying and can be combined with green enhancers such as Na-thiosulfate. It can be used as a direct drop-in to water-, methanol- or hydrocarbon solvent-based formulations. Further, it has shown great promise in organic acid inhibition.

StimWell HTF is a versatile fluid based on the chelating agent GLDA for use in descaling and well stimulation. StimWell HTF creates wormholes in limestone at temperatures up to 350°F with minimal risk of face dissolution. In sandstone, the product dissolves carbonate and iron-based particles to improve permeability without affecting innate clays. Readily biodegradable, the product inherently controls iron and induces a low corrosion rate. The treatment thus requires a minimum of extra additives, even in presence of sensitive equipment such as an ESP. StimWell HTF is compliant with OSPAR regulations, making it suitable for environmentally regulated areas.

StimWell DGH is a scale dissolver based on high pH GLDA that is effective against CaCO₃ and powerful in CaSO₄ dissolution with negligible corrosion even at 300°F without an inhibitor. Thermally stable up to 400°F it can be safely used in descaling operations in most areas because of its high biodegradation (>60% as per OECD 301D and >20% as per OECD 306) and favourable eco-tox levels which meet the needs for onshore and offshore use, including the North-East Atlantic.

Witbreak NEO-110, NEO-120 and NEO-130 are our second generation of OSPAR-compliant demulsifier bases, developed to cater to the growing need for sustainable chemistries with low environmental impact. They feature excellent biodegradability in seawater, are BTEX- and NP-free, and are based on sustainable building blocks. Furthermore, these high solids and low pour point demulsifier bases allow customized blending and may be formulated and diluted in non-aromatic solvents. The Witbreak NEO range covers a variety of RSN values from treater/drier to more hydrophilic emulsion resolver/water droppers. Additionally, these products improve cost and performance when compared to the current alternatives.

Contact us for more details
website | nouryon.com/markets/oilfield
email | oilfield@nouryon.com

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.

All information concerning our products and/or all suggestions for handling and use contained herein (including formulation and toxicity information) are offered in good faith and are believed to be reliable. However, Nouryon makes no warranty express or implied (i) as to the accuracy or sufficiency of such information and/or suggestions, (ii) as to any product's merchantability or fitness for a particular use or (iii) that any suggested use (including use in any formulation) will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. The user must determine for itself by preliminary tests or otherwise the suitability of any product and of any information contained herein (including but not limited to formulation and toxicity information) for the user's purpose. The safety of any formulations described herein has not been established. The suitability and safety of a formulation should be confirmed in all respects by the user prior to use. The information contained herein supersedes all previously issued bulletins on the subject matter covered.

Products mentioned are trademarks of Nouryon and registered in many countries.

nouryon.com