



Products for Oilfield Applications

Delivering proven and sustainable oilfield solutions

INDORAMA
VENTURES
Integrated Oxides & Derivatives

> *Empowering potential.*

Global Technology

UNITED STATES

Regional Office

- The Woodlands (Texas)

Research and Development Site

- The Woodlands (Texas)

Manufacturing Location

- Clear Lake (Texas)
- Chocolate Bayou (Texas)
- Dayton (Texas)
- Lake Charles (Louisiana)
- Port Neches (Texas)

SOUTH AMERICA

Regional Office

- Mexico City, Mexico

APAC

Regional Office

- Mumbai, India
- Botany, Australia

Research and Development Site

- Brooklyn, Australia
- Mumbai, India

Manufacturing Location

- Ankleshwar, India
- Botany, Australia

Indorama provides a diverse range of products

Indorama Ventures Oxides & Derivatives is a leading chemical intermediates and surfactants producer with a diverse range of products in growth markets. Our products are used in a variety of applications throughout the oil production industry — from production chemicals, such as corrosion inhibitors, demulsifiers and paraffin dispersants; to drilling additives; and repair systems for cementing failures. Indorama's surfactant chemistries help optimize exploration and production of hydrocarbons. We offer an outstanding range of specialized technologies, world-scale manufacturing, a global distribution network and in-depth understanding of the oil industry's regulatory compliance issues, through the company's Regulatory, Environmental, and Health & Safety (EH&S) departments. Indorama's global manufacturing footprint and experience also allows us to provide customized products. By taking a holistic, full-process approach from product concept through commercial large-scale production, the company is well-placed to deliver proven and sustainable oilfield solutions.



Products

AMINE

Alkanolamines

MEA, DEA, TEA

GLYCOLS

MEG, DEG, TEG

SURFACTANTS

Anionic


Alkylphenol Ether Sulfates
Alkylphenol Ether Phosphates
Anionic Blends
Alkyl Sulfates
Alkyl Ether Carboxylic Acids and Salts
Alkyl Ether Sulfates
Sulfosuccinates
Alkyl Phosphates
Alkylbenzene Sulfonic Acids and Salts

Nonionic

Alkyl Polysaccharides
Alkylamine Ethoxylates
Block Copolymers
Alkoxylates

Polymeric

Alpha Olefin Maleic Anhydride Copolymers (AOMA)



Drilling Products

CLEANING AND COMPLETION

Alkylpolysaccharide

Vegetable-based Surfactants

Extended Chain Surfactants

SURFONIC® XTF 955

SURFONIC® VBS-D10

SURFONIC® OFE 201

DEFOAMER

Alcohol Alkoxylates

SURFONIC® LF Series

SURFONIC® P Series

SURFONIC® OFW 306

EMULSIFIERS

Amine-based Surfactants

Fatty Alcohol Ethoxylates

Polymers

Esters

SURFONIC® N Series

SURFONIC® OFE Series

SURFONIC® MW Series

SURFONIC® DA Series

SHALE INHIBITORS

Alkoxylates

SURFONIC® OFS 500

SURFONIC® OFS 600

SURFONIC® L4-3

VISCOSITY CONTROL

Polyols

SURFONIC® OFS 300

WETTING AGENTS

Ethoxylates

SURFONIC® N Series

SHALE INHIBITORS

■ **SURFONIC® OFS 500 polyol** is a cloud point glycol system useful for lubrication and as a shale anti-swelling agent for water-based drilling muds used in formations with reactive shales. The product functions as a partial potassium chloride (KCl) replacement in drilling formulations. It is possible to tune the performance of the SURFONIC® OFS 500 to the temperature and KCl salt concentration of the mud system. The product is registered on chemical inventories in many regions of the world. A separate bulletin further describing the use and benefits of SURFONIC® OFS 500 polyol is available upon request.

VISCOSITY CONTROL

■ **SURFONIC® OFS 300 additive** is a high molecular weight polyglycol. It can also be used in water-based muds to build viscosity and to protect water-sensitive shale.

EMULSIFIERS

■ **SURFONIC® MW-100 optimized emulsifier** is for vegetable oils. It can be used to formulate emulsion muds or as a cleaner to remove a vegetable oil-based mud from casing prior to cementing.

■ **SURFONIC® OFE 243 and OFE 244 polymeric surfactant emulsifiers** are for oil-based muds with an internal phase with electrolytes.

■ **XTF 951** is a polyglycerol drilling fluid additive for invert drilling applications. It can be used as the internal phase of a non-aqueous mud to minimize the shale swelling caused by a water internal phase. The product is also useful in lubricating the drilling mud to reduce “fretting.” XTF 951, which is water-soluble and considered to be of low toxicity, can act as a shale inhibitor in water-based muds as well.



Cementing Applications

WELL BORE CLEANUP

Extended Chain Surfactants

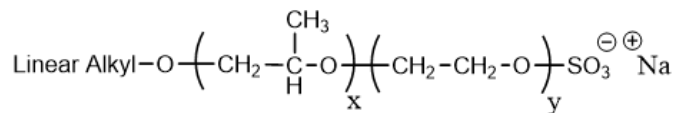
Formulated Detergents

SURFONIC® OFE 201

SURFONIC® VBS-D10

- The ultra-low IFT provided by **SURFONIC® OFE 201 surfactant** allows well bore cleanup in high-brine completion fluids.

SURFONIC® OFE 201



Production Chemicals

CLEANERS/DEGREASERS

Alkylether Methyl Blends

Linear Alkylbenzene Sulfonic Acid

Sulfonates

SURFONIC® VBS Series

SURFONIC® OFE 321

SURFONIC® OFE 201

CORROSION INHIBITORS - WATER SOLUBLE

Quaternary Ammonium Compounds

Nonylphenol Ethoxylates

TERIC® N Series

SURFONIC® N Series

CORROSION INHIBITORS

Imidazoline

Phosphate Esters

Alkoxyated Fatty Amines

Amine Derivatives

SURFONIC® EDA-4/80

SURFONIC® OFC 100

SURFONIC® PE Series

SURFONIC® T Series

DEFOAMERS

Polyols

Fatty Alcohol Ethoxylates

SURFONIC® POA-17R2

SURFONIC® LF Series

DEMULSIFIERS

Anionic

SURFONIC® OFD 750

SURFONIC® OFD 775

SURFONIC® XOF-22A

Polyol

SURFONIC® OFD 101

SURFONIC® OFD 328

SURFONIC® OFD 335

SURFONIC® POA-17R2

SURFONIC® POA-L61

UNIMAX™ WL 660

UNIMAX™ WL 5000

Oxyalkylated Polyamine

SURFONIC® OFD 150

SURFONIC® OFD 301

SURFONIC® OFD 302

SURFONIC® OFD 360

HYDRATE INHIBITORS

MEG

Polymeric

SURFONIC® OFH Series

PARAFFIN AND ASPHALTENE CONTROL

Maleic-based Polymers

Ethoxylates

Alkylbenzene Sulfonates

Sulfonates

SURFONIC® OFP Series

SURFONIC® OFA Series

SURFONIC® L Series

SURFONIC® OFE 201

SCALE INHIBITORS

Phosphate Esters

Amine Phosphates

SURFONIC® PE Series

SURFONIC® EDA-4/80

SURFONIC® OFI Series

SPECIALIZED SOLVENTS

Alcohol Ethoxylates

Glycol-based Solvents

SURFONIC® L Series

SULFUR SCAVENGERS

Triazines

SURFONIC® XTA 793

SURFONIC® XTA 797

WATER CLARIFIERS

Polymers

Polysaccharides

SURFONIC® NB Series

SURFONIC® PC Series

ECOTERIC™ 7500

Production Chemicals

SCALE INHIBITORS

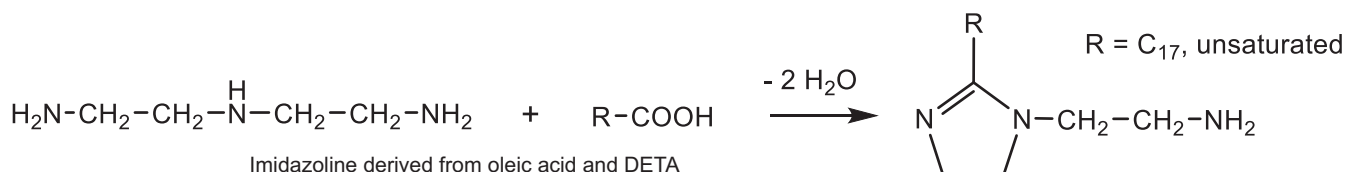
- **XTA 892** and **SURFONIC® EDA-4/80 amine ethoxylates** can be reacted with fatty acid anhydrides or mixed with acidic phosphate esters to form corrosion inhibitors for water- and oil-based systems.
- **SURFONIC® OFI 230S** and **232S polyaminomethylene phosphonates** can be used in scale inhibiting.
- **SURFONIC® PE-2852 phosphate ester** can be used without further reaction as a scale inhibitor.

PARAFFIN AND ASPHALTENE CONTROL

- **SURFONIC® OFP 359, OFP 961, OFP 962, OFP 963, OFP 964** and **OFP 965 polymers** are pour point depressants for waxy crude oil. They work by modifying the crystal structure of paraffin in produced fluids.
- In hot oiling applications, **SURFONIC® N Series nonylphenol ethoxylates** and **XOF-30A alkylbenzene sulfonic acid** are used to help penetrate and dissolve the wax during treatment.
- Other paraffin dispersants can be formulated from solvent mixtures and surfactants. One example is a mix of Stoddard solvent with **SURFONIC® L24-2** and **L24-9 surfactants**.
- **JEFF-FLOW® A 2524 surfactant** is an oil-soluble asphaltene dispersant capable of both preventing precipitation of asphaltenes and redispersing previously settled agglomerations.
- **XOF-22A, XOF-23A** and **XOF-26A alkylaryl sulfonates**, with side chains of short, intermediate and long length, are able to keep asphaltenes dispersed in crude oil and oil emulsions.
- **SURFONIC® OFA 830 dispersant** is a polymeric asphaltene dispersant effective in lowering the viscosity of heavy crudes and preventing asphaltene deposition.

CORROSION INHIBITORS

- Indorama offers **SURFONIC® OFC 100** which is a 1:1 DETA: TOFA imadazoline. More water-soluble imidazoline derivatives may be prepared via ethoxylation. **SURFONIC® OFC 105, 110** and **120** are the 5-, 10- and 20- mole ethoxylates of SURFONIC® OFC 100, respectively.
- **XTA 892** and **SURFONIC® EDA-4/80 products** are ethoxylated ethyleneamines that can be reacted with fatty acid anhydrides or mixed with acidic phosphate esters to form corrosion inhibitors for water- and oil-based systems. (US Patents 5,582,792; 5,391,636 and 3,514,251).
- **Ethanolamines DEA** can be used for acid neutralization.
- Phosphate esters derived from ethoxylated alcohols or alkylphenols can be formulated into corrosion inhibitors for high water-cut systems in the oilfield. (US Patents 5,611,992 and 3,510,436). **SURFONIC® PE-1198LA** and **PE-2852 surfactants** are products for consideration in this application. **SURFONIC® T Series surfactants** can be used to neutralize the phosphate esters, giving some alkalinity and buffering to the formulation.
- Alkoxylated fatty amines, like **SURFONIC® T-2 surfactant**, can be used to prevent corrosion and to thicken hydrochloric acid (HCl) in acidizing formulations. Generally, propargyl alcohol is used in combination with the surfactant for complete anti-corrosion protection.
- **Ethanolamine TEA** can be used to make phosphates.





Integrated Oxides & Derivatives

About Indorama

Indorama Ventures is a world-class chemical company and a global integrated leader in PET and fibers serving major customers in diversified end-use markets. Following our core strategies, we develop innovative products for customer needs and to make great products for society. Headquartered in Bangkok, Thailand, Indorama Ventures has operating sites in 31 countries on five continents – in Africa, Americas, Asia, Europe & Eurasia.

Integrated Oxides & Derivatives

Indorama Ventures Oxides & Derivatives is a leading chemical intermediates and surfactants producer with a diverse range of products in growth markets such as home & personal care, agrochemicals, oilfield technologies, fuel & lube additives and more.

In January 2020, Indorama Ventures Public Company Limited completed its acquisition of Huntsman's world-class integrated oxides and derivatives business, including:

- **Surfactants:** Integrated producer of a wide range of products for home and personal care, oilfield technologies, agriculture and process industries.
- **Ethylene and Derivatives:** Highly integrated manufacturer of ethylene, ethylene oxide, ethylene glycol, ethanolamines and other derivatives.
- **Propylene Oxide & Derivatives:** Highly competitive technology offerings in propylene glycol, methyl tertiary butyl ether (MTBE) and other derivatives.

Our operating sites include a large flagship site on the US Gulf Coast (USGC) at Port Neches, as well as Chocolate Bayou, Dayton and Clear Lake in Texas, Lake Charles, Louisiana, Ankleshwar, India and Botany, Australia.

Australia

Indorama Ventures Oxides
IVL Brooklyn, Victoria
61 Market Road
Brooklyn VIC 3025
Australia
+61-3-9933-6696

Europe

Indorama Ventures Oxides
IVL Everberg
Everslaan 45
3078 Everberg
Belgium
+32-2-758-9544

Brazil

Indorama Ventures Oxides
IVL Santo Amaro
Av. Das Nações Unidas,
12,551 – 8th floor
Brooklin Novo
Sao Paulo- SP
04578-903
Brazil
+11-2111-1683

Disclaimer

Indorama Ventures Oxides LLC warrants only that its products meet the specifications stated herein, if any. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications. While all the information presented in this document is believed to be reliable and to represent the best available data on these products, INDORAMA MAKES NO WARRANTY OR GUARANTEE OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT OF ANY THIRD PARTY, OR WARRANTIES AS TO QUALITY OR CORRESPONDENCE WITH PRIOR DESCRIPTION OR SAMPLE, AND ANY USER OF PRODUCTS DESCRIBED HEREIN SHOULD CONDUCT A SUFFICIENT INVESTIGATION TO ESTABLISH THE SUITABILITY OF ANY PRODUCT FOR ITS INTENDED USE AND ASSUMES ALL RISK AND LIABILITY WHATSOEVER RESULTING FROM THE USE OF SUCH PRODUCT, WHETHER USED SINGLY OR IN COMBINATION WITH OTHER SUBSTANCES. Product(s) described in this publication may be hazardous and/or toxic and require special precautions in handling. For all product(s) described herein, the user should obtain from Indorama detailed information on hazards and/or toxicity, together with proper shipping, handling, and storage procedures, and should comply with all applicable safety and environmental standards. The behavior, hazards and/or toxicity of the product(s) referred to in this publication in manufacturing processes and their suitability in any given end-use environment are dependent upon various conditions such as chemical compatibility, temperature, and other variables, which may not be known to Indorama. It is the sole responsibility of the user of such product(s) to evaluate the manufacturing circumstances and the final product(s) under actual end-use requirements and to adequately advise and warn future purchasers and users thereof.

UNIMAX®, ECOTERIC®, SURFONIC®, TERIC® are registered trademarks of Indorama Ventures Oxides LLC or an affiliate thereof in one or more, but not all, countries.

Copyright © 2020 Indorama Ventures Oxides LLC or an affiliate thereof. All rights reserved.

India

Indorama Ventures Oxides
IVL Ankleshwar
Plot No 321,
GIDC - Panoli, Ankleshwar
Gujarat - 394116
India
+022-42875100

Mexico

Indorama Ventures Oxides
IVL Mexico City
Av. Prolongación Paseo de la Reforma
No. 1015 Torre A piso 2
Santa Fe Cuajimalpa
Delegación Cuajimalpa de Morelos
Indorama Ventures Oxides
05348 Mexico City, CMX
Mexico
+52-55-9177-5700

Global Headquarters

Indorama Ventures Oxides IVL
24 Waterway Ave., Suite 1100
The Woodlands, TX 77380
United States of America
+1-888-674-9009