Outstanding Environmental Properties

Shell GTL Saraline 185V is a synthetic base fluid derived from natural gas and is environmentally friendly. It is classified as a synthetic base fluid (SBF, Group III: low to negligible aromatic content) for Non-Aqueous Drilling Fluid (NADF) mud formulations under the definitions provided by the International Association of Oil and Gas Producers (OGP).

Shell GTL Saraline 185V has an extremely favourable environmental profile which makes it an excellent candidate as an environmentally-friendly drilling base fluid. This is evident from the offshore discharge approval of drill cuttings received in Malaysia, Australia, New Zealand, Thailand, Indonesia, Brunei, India, Nigeria, Dubai and most recently, in China. Shell GTL Saraline 185V is classified as a synthetic base fluid (SBF, Group III: low to negligible aromatic content) for Non-Aqueous Drilling Fluid (NADF) mud formulations under the definitions provided by the International Association of Oil and Gas Producers (OGP).

Minimal Health and Safety Risk

Shell GTL Saraline 185V does not contain known carcinogens (e.g.: poly-aromatic hydrocarbons) nor BTEX (benzene, toluene, ethylbenzene and xylenes). Sulphur and aromatics, all of which provide safe working conditions for operators. It does not contain known carcinogens (e.g.: poly-aromatic hydrocarbons) nor BTEX (benzene, toluene, ethylbenzene and xylenes). Shell GTL Saraline 185V is readily biodegradable in both marine water (OECD 306) and freshwater (OECD 301F). It is also suitable for deep water environments with mud conditioning, and ultimately reducing non-performing time (NPT).

Low Ecotoxicity

Shell GTL Saraline 185V is a non-toxic and non-weathering chemical. It does not bioaccumulate and is non-toxic. Its superior environmental performance is confirmed with an OCNS (Offshore Chemical Notification Scheme for the North Sea) ranking of group E (lowest environmental hazard).

Bioremediation

Shell GTL Saraline 185V shows excellent potential for bioremediation through land-farming methods producing successful plant growth media, sulphur and aromatics, all of which provide safe working conditions for operators. It does not contain known carcinogens (e.g.: poly-aromatic hydrocarbons) nor BTEX (benzene, toluene, ethylbenzene and xylenes). It is readily biodegradable in both marine water (OECD 306) and freshwater (OECD 301F). It is also suitable for deep water environments with mud conditioning, and ultimately reducing non-performing time (NPT).
Outstanding Environmental Properties

Shell GTL Saraline 185V is classified as a synthetic base fluid (SBF) Group III (low to negligible aromatic content) for Non-Aqueous Drilling Fluid (NADF) mud formulations under the definitions provided by the International Association of Oil and Gas Producers (OGP).

- **Low Ecotoxicity**: Shell GTL Saraline 185V has proven low ecotoxicity with its rapid degradation as shown in OECD 201 (marine water) and OECD 202 (freshwater), and its lack of chronic effects in OECD 203.
- **Biodegradability**: Shell GTL Saraline 185V is readily biodegradable in both marine water (OECD 306) and freshwater (OECD 301F).
- **Minimal Health and Safety Risk**: Shell GTL Saraline 185V has proven minimal health and safety risks with its low volatility, low flash point (161°C), and low toxicity.
- **Non-Aqueous**: Shell GTL Saraline 185V is essentially non-aqueous, containing 98% by weight hydrocarbons, ensuring high performance and minimal environmental impact during handling and use.
- **Approved for Offshore Discharge**: Shell GTL Saraline 185V has been approved for offshore discharge, ensuring safe and responsible waste management practices.

The drilling base fluid of choice for leading operators

Shell GTL Saraline 185V is the epitome of the Shell brand: high quality, high performance and highly reliable. Its distinctive properties result in excellent drilling performance in a wide range of conditions, in addition to outstanding environmental attributes.

- **Excellent Drilling Performance**: Shell GTL Saraline 185V is suitable for all well conditions, ensuring high yield, minimal washout, and reduced wellbore instability. Its low viscosity results in a better equivalent circulating density (ECD), faster drilling rate and lower circulation time (NPT), with good flow properties.
- **High Thermal Stability**: Shell GTL Saraline 185V has a high working temperature of 40°F or 4.4°C, enabling better mud conditioning and performance in high-temperature wells.
- **Low Viscosity**: Shell GTL Saraline 185V has a low viscosity, allowing for increased hole cleaning efficiency.
- **Rheological Profile**: Shell GTL Saraline 185V has a relatively flat rheological profile, providing good flow properties over a wide range of densities.

Shell GTL Saraline 185V is an innovative, non-toxic, multi-application synthetic drilling base fluid derived from natural gas. It is at the forefront in meeting drilling demands and challenges of the future in the most environmentally-friendly and safe manner – from scorching desert to subarctic temperatures, from deep water to high-temperature wells.

The Process

Shell pioneered the Fischer-Tropsch GTL technology in the world’s first full-scale GTL plant of its kind in Bintulu, Malaysia, achieving commercial GTL production in 1993. Shell is today a leading player in the global GTL market, with a world-class GTL technology platform, supported by two unique Gas-to-Liquids (GTL) plants and over a dozen supply hubs across the globe. Used in over 20 countries, it has a proven track record of excellence with supply security through a world-class distribution network, supported by two unique Gas-to-Liquids (GTL) plants worldwide.

SHELL GTL SARALINE 185V

The drilling base fluid of choice for leading operators

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SHELL GTL SARALINE 185V

Synthetic Base Fluid for High Performance Drilling

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 Disclaimer: This document is for informational purposes only and shall in no event be treated as a substitute for professional advice. Any use of this document shall be governed by the laws and regulations of the country of origin.
Outstanding Environmental Properties

Shell GTL Saraline 185V is classified as a synthetic base fluid (SBF, Group III: low to negligible aromatic content) for Gas Producers (OGP).

- **Approved for Offshore Discharge**
- **Minimal Health and Safety Risk**
- **Low Ecotoxicity**
- **Bioremediation**

Shell GTL Saraline 185V consists of a specific range and class of hydrocarbons (linear and branched paraffins) which are readily biodegradable in both marine water (OECD 306) and freshwater (OECD 301F).

Shell GTL Saraline 185V is a non-aqueous drilling fluid (NADF) mud formulation under the definitions provided by the International Association of Oil and Gas Producers (IAPG).

Shell GTL Saraline 185V is an innovative, non-toxic, multi-application synthetic drilling base fluid derived from natural gas.

- **Synthetic Base Fluid for High Performance Drilling**
- **Approved for Offshore Discharge**
- **Minimal Health and Safety Risk**
- **Low Ecotoxicity**
- **Bioremediation**

Shell GTL Saraline 185V has an extremely favourable environmental profile which makes it an excellent candidate as an environmentally-friendly drilling base fluid. This is evident from the offshore discharge approval of drill cuttings received in Malaysia, Australia, New Zealand, Thailand, Indonesia, Brunei, India, Nigeria, Dubai and most recently, in China.

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Shell GTL Saraline 185V consists of a specific range and class of hydrocarbons (linear and branched paraffins) which are readily biodegradable in both marine water (OECD 306) and freshwater (OECD 301F).
We continue to build on our excellent customer service track record through our strong sales, marketing and technical teams.

CASE STUDY

Shell GTL Saraline 185V is used in onshore & offshore drilling

Shell GTL Saraline 185V is used in onshore & offshore drilling.

Shell GTL Saraline 185V was also used as a base fluid in Hydraform Proothing.

Shell GTL Saraline 185V has been used to support good logging.

Shell GTL Saraline 185V...
Global Coverage

Manufacturing, Sales, Distribution and Customer Service

In Shell, we are committed to high quality, excellent on-time delivery and strong customer service through constant control and monitoring of all manufacturing processes -- from incoming feedstock to the finished products.

Shell GTL Saraline 185V is globally available with supply going through developed networks in partnership with strategic distributors who excel in supply security through widespread regional hubs in storage and logistics.

We continue to build on our excellence in customer service with track record through our strong sales, marketing and technical teams.

Proven Track Record in Onshore & Offshore Drilling

Shell GTL Saraline 185V is used by operators worldwide:
- Argentina
- Bangladesh
- Bangladesh
- Benin
- Bhutan
- Botswana
- Brunei
- Bulgaria
- Cambodia
- Chile
- China
- Colombia
- Comoros
- Congo
- Costa Rica
- Côte d’Ivoire
- Cuba
- Ecuador
- Egypt
- Ethiopia
- Fiji
- France
- Gabon
- Georgia
- Ghana
- Greece
- Guernsey
- Guinea
- Guyana
- Hong Kong
- India
- Indonesia
- Indonesia
- Indonesia
- Iran
- Iraq
- Israel
- Italy
- Japan
- Jordan
- Kazakhstan
- Kenya
- Korea
- Kuwait
- Laos
- Lebanon
- Libya
- Malaysia
- Maldives
- Mauritania
- Mauritius
- Mexico
- Myanmar
- Namibia
- Nauru
- Nepal
- Netherlands
- New Zealand
- Nigeria
- Oman
- Pakistan
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russian Federation
- Saudi Arabia
- Senegal
- Singapore
- South Africa
- South Korea
- Spain
- Sri Lanka
- Sudan
- Swaziland
- Sweden
- Switzerland
- Tanzania
- Thailand
- Togo
- Tonga
- Trinidad & Tobago
- Tunisia
- Turkey
- Uganda
- United Arab Emirates
- United Kingdom
- United States of America
- Uruguay
- Uzbekistan
- Vietnam
- Venezuela
- Vietnam
- Vietnam
- Vietnam
- Vietnam
- Yemen
- Zambia
- Zimbabwe

Shell GTL Saraline 185V is also used as a base fluid in Hydraulic Fracturing.

Shell GTL Saraline 185V is also ideally suited for hydraulic fracturing.

- Excellent health, safety and environmental performance due to low frictional losses, low density, low volatility and low odour.
- Shell GT L Saraline 185V is preferably used as an effective, low toxicity base fluid.
- Biodegradability, low toxicity and no BTEX make Shell GTL Saraline 185V suitable for a variety of applications.
- Reduced viscosity at high temperature allows for easy injection into the reservoir.
- Shell GTL Saraline 185V is a viable option when faced with environmental concerns.

Shell GTL Saraline 185V is also used as a base fluid in Hydraulic Fracturing.

CASE STUDY

Shall GTL Saraline 185V vs diesel in land drilling

Shell GTL Saraline 185V has performed very well in China. The Shell GTL Saraline 185V based mud in land drilling operations has proven to provide a marginally higher ROP (10-30%), shorter set-up time, faster circulation time, and lower mud consumption. A significant reduction of diesel fuel consumption has been demonstrated. The Shell GTL Saraline 185V mud system was widely deployed in China's land drilling operations over the past 15 years.

Shell GTL Saraline 185V is also used as a base fluid in Hydraulic Fracturing.

- Shell GTL Saraline 185V is used with success for hydraulic fracturing.

Customer Satisfaction

Shell GTL Saraline 185V has performed very well in China. The Shell GTL Saraline 185V based mud in land drilling operations has proven to provide a marginally higher ROP (10-30%), shorter set-up time, faster circulation time, and lower mud consumption. A significant reduction of diesel fuel consumption has been demonstrated. The Shell GTL Saraline 185V mud system was widely deployed in China's land drilling operations over the past 15 years.

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Shell GTL Saraline 185V is also used as a base fluid in Hydraulic Fracturing.
GLOBAL COVERAGE
Manufacturing, Sales, Distribution and Customer Service

At Shell, we are committed to high quality as reflected in our practice of only sourcing through contract control and monitoring of all manufacturing processes for our customers. Shell GTL Saraline 185V is globally available with supply varying through dedicated specialty veterinarians with strong distribution networks used in diverse and chemical markets.

We continue to build on our excellent customer service track record through our strong sales, marketing and technical teams.

Proven Track Record in Onshore & Offshore Drilling

Shell GTL Saraline 185V has held a place in the top 3 operators worldwide in terms of API 15A mud. The brand offers a high degree of stability in underbalance drilling and an improved pitch for improved quality assurance through constant control and monitoring of our manufacturing processes – in our policy of strict quality assurance through constant control and monitoring of our manufacturing processes.

Shell GTL Saraline 185V is used by operators worldwide:

- Angola
- Argentina
- Bangladesh
- Brunei
- China
- Chile
- Colombia
- Costa Rica
- France
- Ghana
- Indonesia
- Italy
- Japan
- Korea
- Malaysia
- Myanmar
- Netherlands
- Nigeria
- Oman
- Peru
- Philippines
- Qatar
- Peru
- Russia
- Saudi Arabia
- Singapore
- South Africa
- South Korea
- Thailand
- United Arab Emirates
- United States

Shell GTL Saraline 185V is also ideal as a base fluid in hydraulic fracturing.

- Less non-performing time (NPT)
- Simple and lower cost
- Less fluid for disposal
- Less rig time
- Better well costs
- Lower total well costs and planing significant benefits in onshore land drilling operations.

CASE STUDY
Shell GTL Saraline 185V vs diesel in land drilling

- Improved Drilling and Equipment Maintenance
- Advanced Waste Management
- Better Customer Satisfaction
- Extreme Well Control

- Enhanced drilling performance
- Higher ROPs
- Lower OPEX
- Improved equipment maintenance
- Enhanced waste management

Shell GTL Saraline 185V provided good haul-away ability under field conditions. The SBM did not cause any stoppage or any problem related to the performance of drilling equipment. The well site was kept clean with no harm to environment.

Customer Satisfaction

- Enhanced drilling performance
- Higher ROPs
- Lower OPEX
- Improved equipment maintenance
- Enhanced waste management

Shell GTL Saraline 185V is used by operators worldwide.

- Shell GTL Saraline 185V in Asia
- Shell GTL Saraline 185V in Europe
- Shell GTL Saraline 185V in the Americas
- Shell GTL Saraline 185V in the Middle East
- Shell GTL Saraline 185V in Africa
- Shell GTL Saraline 185V in the Asia-Pacific Region

BENEFITS

- Easier to attract best talent
- Strongly preferred by workers
- Improve working conditions
& dermal exposure to rig workers

- Significant reduction of inhalation
- Less road exposure
- No harm to environment
- Less non-performing time (NPT)
- Less fluid for disposal
- Less rig time
- Better well costs
- Lower total well costs and planing significant benefits in onshore land drilling operations.

TECHNICAL SPECIFICATIONS

- High Flash Point and Low Viscosity

- Least Toxic OCNS Rating vs Others

- Odourless, easy to clean
- No elastomer failure due to high aniline point
- Chemical reconditioning cost: 30% lower
- Drilling fluid consumption: 30%-50% lower
- Drilling mud recovery at solid control system: 38%-58% higher
- Overall rate of penetration (ROP): 10-30% higher
- No BTEX and extremely low aromatics, thus an environmentally - friendly fluid for hydraulic fracturing
- The preferred health, safety and waste management fluid

- No harm to environment
- Less non-performing time (NPT)
- Less fluid for disposal
- Less rig time
- Better well costs
- Lower total well costs and planing significant benefits in onshore land drilling operations.

Stable Properties over a Wide Range of Temperatures

- Pilot study has shown that Shell GTL Saraline 185V is compatible with all major clay systems and can be used in a wide range of laminar operating conditions.

If you have any questions, please feel free to contact us.

Shell GTL Saraline 185V is the most toxic while Group “E” is the least toxic.

The OCNS (i.e., Offshore Chemical Notification Scheme) list is produced by CEFAS on behalf of the United Kingdom Department for Energy and Climate Change and the Netherlands State Supervision of Mines. Group “A” is the most toxic while Group “E” is the least toxic.

The following table shows the OCNS rating for Shell GTL Saraline 185V:

| Group | OCNS Rating | Details of OCNS Rating
|-------|-------------|-----------------------|
| A     | High Toxicity \( \text{LTMO} = \text{Low Toxicity Mineral Oil} \) | \( \text{TD} = \text{Total Diet} \)
| B     | Moderate Toxicity | \( \text{LD} = \text{Lethal Dose} \)
| C     | Low Toxicity | \( \text{LC} = \text{Lethal Concentration} \)
| D     | Non-toxic | \( \text{TMD} = \text{Toxic Material Dose} \)
| E     | Non-toxic | \( \text{ND} = \text{Not Detected by GC/MS} \)

* Details of OCNS Rating.
GLOBAL COVERAGE
Manufacturing, Sales, Distribution and Customer Service

Our partnership with strategic distributors who excel in supply security through widespread regional hubs in every major oil producing region, from incoming feedstock to the finished products.

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Proven Track Record in Onshore & Offshore Drilling

Shell GTL Saraline 185V is used by operators worldwide:
- Angola
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- Bangladesh
- Bolivia
- Brazil
- Brunei
- Chile
- China
- Colombia
- Democratic Republic of Congo
- Ecuador
- Egypt
- Ethiopia
- France
- Greece
- Guatemala
- Hungary
- Indonesia
- Iran
- Iraq
- Italy
- Japan
- Jordan
- Kenya
- Korea
- Kuwait
- Lebanon
- Libya
- Malaysia
- Mexico
- Mozambique
- Netherlands
- New Zealand
- Nigeria
- Norway
- Oman
- Pakistan
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russia
- Saudi Arabia
- Senegal
- Singapore
- Slovakia
- South Africa
- South Korea
- Spain
- Sri Lanka
- Sudan
- Sweden
- Switzerland
- Trinidad & Tobago
- Turkey
- United Arab Emirates
- United Kingdom
- United States
- Ukraine
- United Arab Emirates
- United States
- Vietnam
- Venezuela
- Vietnam
- Yemen
- Yugoslavia

CASE STUDY

Shell GTL Saraline 185V was used in a recent offshore drilling project in the Gulf of Mexico. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

Shell GTL Saraline 185V is used in a deepwater drilling project in the Gulf of Mexico. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

Shell GTL Saraline 185V is utilized in a recent onshore drilling project in India. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

Shell GTL Saraline 185V is utilized in a recent onshore drilling project in China. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

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Shell GTL Saraline 185V is utilized in a recent onshore drilling project in Pakistan. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

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Shell GTL Saraline 185V is utilized in a recent onshore drilling project in Senegal. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

Shell GTL Saraline 185V is utilized in a recent onshore drilling project in Spain. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

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Shell GTL Saraline 185V is utilized in a recent onshore drilling project in Switzerland. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

Shell GTL Saraline 185V is utilized in a recent onshore drilling project in Trinidad & Tobago. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.

Shell GTL Saraline 185V is utilized in a recent onshore drilling project in Turkey. The drilling process was significantly faster and more efficient compared to traditional drilling methods. Shell GTL Saraline 185V provided good hole stability and helped to prevent potential hazards during drilling operations.
Shell GTL Saraline 185V is an innovative, non-toxic, multi-application synthetic drilling base fluid derived from natural gas, according to the GTL process diagram below.

It is the culmination of 20 years of research into the utilisation of natural gas for the production of synthetic fuels and specialty chemicals, according to the GTL process diagram below.

Achieving commercial GTL production in 1993, Shell has since expanded production capacity to meet the world's growing demand for alternative energy sources.

Shell GTL Saraline 185V is an innovative, non-toxic, multi-application synthetic drilling base fluid derived from natural gas, according to the GTL process diagram below.

The whole reaction is irreversible.

Key

NATURAL

GAS

Carbon

Hydrogen

Oxygen

“SYNGAS”

Fischer-Tropsch (FT) Distillates

WATER

Paraffins

Derived from the heart of Shell's innovation, Shell GTL Saraline 185V is the epitome of the Shell brand: high quality, high performance and highly reliable.

SHELL GTL SARALINE 185V

Synthetic Base Fluid for High-Performance Drilling

Outstanding Environmental Properties

- Bioremediation (Offshore Chemical Notification Scheme for the North Sea) ranking of group E (lowest environmental hazard).
- It does not bioaccumulate and is non-toxic. Its superior environmental performance is confirmed with an OCNS (Offshore Chemicals Notification Scheme) ranking of group E (lowest environmental hazard).
- It does not contain known carcinogens.

Minimal Health and Safety Risk

- Shell GTL Saraline 185V has a low viscosity, a low pour point and relatively high flash point, making it ideal for use in deep water environments.
- It is also suitable for high-temperature high-pressure (HTHP) environments with exceptional thermal stability when temperatures reach 400˚F or 205˚C.

Approved for Offshore Discharge

- Shell GTL Saraline 185V is readily biodegradable in both marine water (OECD 306) and freshwater (OECD 301F).
- It is odourless, has a clear appearance, low volatility, high flashpoint and contains virtually no sulphur and aromatics, all of which provide safe working conditions for operators. It does not contain known carcinogens.
- It is classified as a synthetic base fluid (SBF, Group III: low to negligible aromatic content) for Non-Aqueous Drilling Fluid (NADF) mud formulations under the definitions provided by the International Association of Oil and Gas Producers (OGP).

Approved for Onshore Discharge

- Shell GTL Saraline 185V shows excellent potential for bioremediation through land-farming methods producing successful plant growth media.
- This reduces complexity, costs and safety risks in managing drill cuttings.

Approved for Transportation of Drill Cuttings

- Shell GTL Saraline 185V is classified as a non-hazardous waste for transportation of drill cuttings.
- It is approved for transportation of drill cuttings in Bangladesh, China and New Zealand, and has been approved for offshore discharge in Malaysia, Australia, New Zealand, Thailand, Indonesia, Brunei, India, Nigeria, Dubai and most recently, in China.