



EDC Base Oils Purity and Performance:

the winning combination
for **drilling fluids**

specialfluids.totalenergies.com | 



TotalEnergies

TotalEnergies Fluids SAS - Head office: 24 cours Michelet - 92069 Paris la Défense Cedex - France - T +33(0) 1 41 35 40 00 - Share capital: €6,920,000.00, Registered in Nanterre: RCS B 342 241 908 - Photo credits: Julien Muguet TotalEnergies, Marc Roussel TotalEnergies, TEP Barnett, Shutterstock, AdobeStock - December 2021

The Special Fluids division of TotalEnergies: A global network with a local touch

A recognised GLOBAL LEADER

HEALTH AND SAFETY ARE THE CORNERSTONES OF OUR PROCESSES



Storage facilities **WORLDWIDE**



MULTI-SKILLED TEAMS of passionate, seasoned specialists

A WIDE SELECTION OF PRODUCTS FOR VARIOUS INDUSTRIAL APPLICATIONS

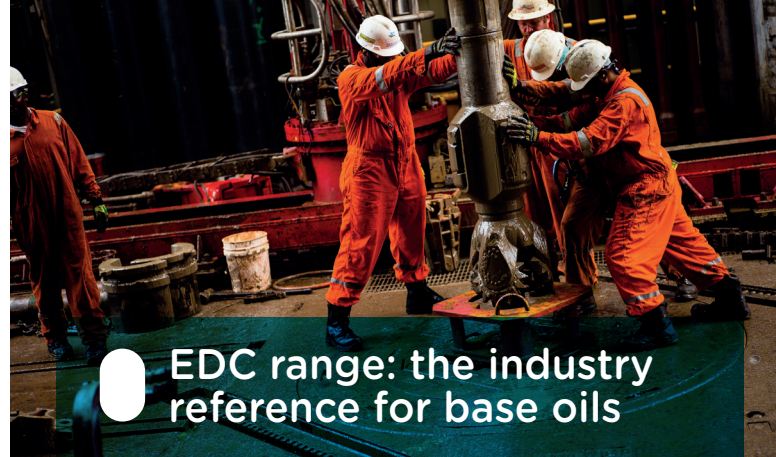


PLANTS in France, in the US and South Korea*



3 LEADING-EDGE R&D CENTRES two in France, one in Belgium, and a technical centre in India

*Joint venture: Hanwha Total Petrochemical



EDC range: the industry reference for base oils

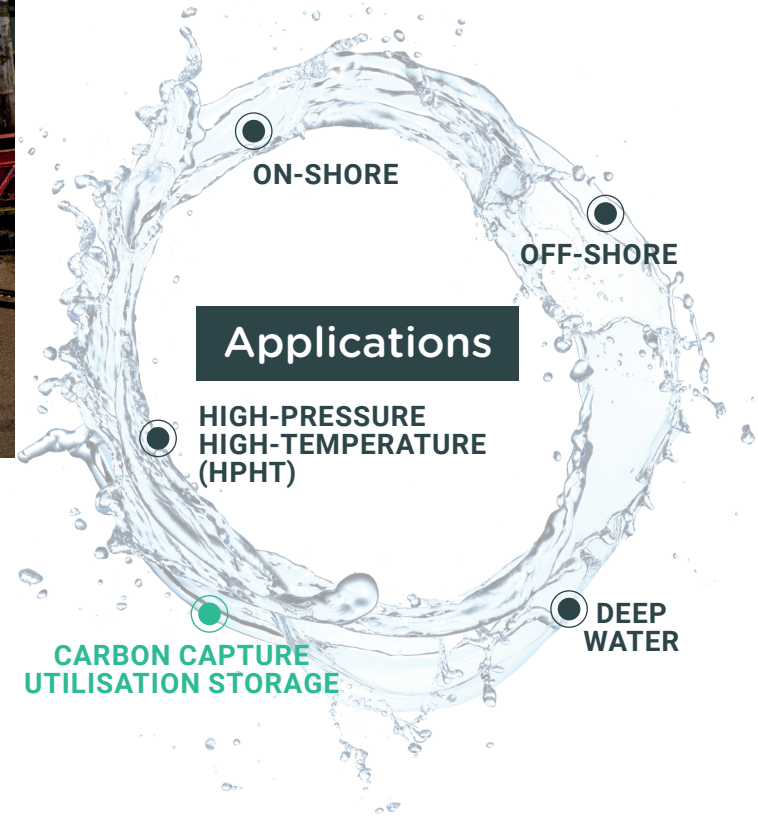
When operating in challenging conditions, the purity of our base oils is key to **drilling performance, cost efficiency and environmental impact**. TotalEnergies Fluids offers the best environmental footprint on the market through **highly refined and stringently hydrotreated fluids**.

Global coverage

With our worldwide locations, we are always close to where you are.



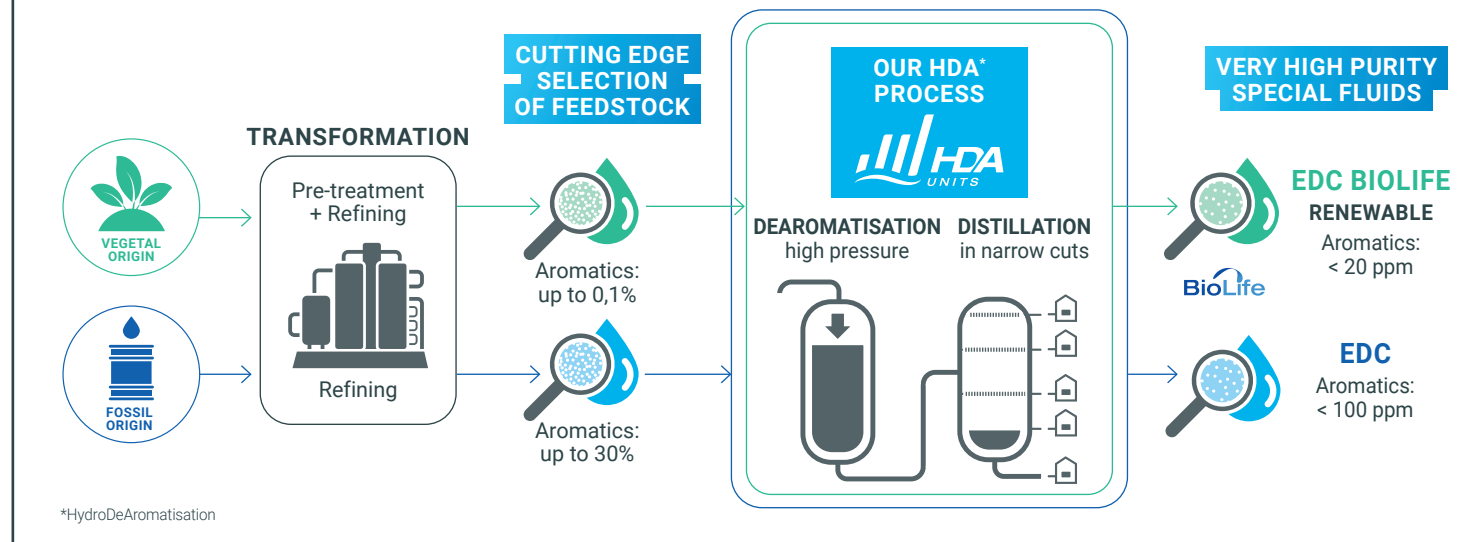
*2021 figures





A high purity range...

EDC base oils have an exceptional level of purity and extremely low aromatic content. Our exacting production process obtains sterling drilling fluids.



For high drilling performance

Whatever the drilling conditions (HPHT, on-offshore, deep water), EDC base oils have been used with great success around the world thanks to their optimized specifications (low viscosity/high flash point).

PROPERTIES	TEST METHODS	EDC 99DW	EDC 170SE	EDC 95-11	EDC 200SE	EDC 250 BIOLIFE
SPECIFIC GRAVITY @ 16°C	ASTM D1298	810 kg/m ³	810 kg/m ³	815 kg/m ³	817 kg/m ³	785 kg/m ³
FLASH POINT IN °F	ASTM D94	> 214°F	> 172°F	> 239°F	> 200°F	> 248°F
VISCOSITY @ 40°C	ASTM D445	2.31 cST	1.69 cST	3.30 cST	2.70 cST	3.15 cST
AROMATIC CONTENT	UV Internal method	< 50 ppm	< 80 ppm	< 100 ppm	< 80 ppm	< 20 ppm
ANILINE POINT IN °F	ASTM D611	> 176°F	> 170°F	> 185°F	> 167°F	> 195°F
POUR POINT IN °F	ASTM D97	-30°F	-85°F	-13°F	-30°F	-58°F
SULFUR CONTENT	ASTM D5453	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm
CARBON DISTRIBUTION	GC2D	C13-C16	C11-C14	C15-C20	C13-C23	C15-C18

Deep water

Deep water
On-shore
Off-shore

HPHT
On-shore
Off-shore

HPHT
On-shore
Off-shore

HPHT
On-shore
Off-shore

Environmentally friendly and safe base oils

- ▶ **Safer working conditions:** Classified as not toxic for human health according to worldwide GHS (skin does not dry or crack as with competitors).
- ▶ **Safe operations near residential areas:** No odour and no public health risk.
- ▶ **Compliance with environmental regulations:** Classified readily biodegradable according to OECD 306 guidelines.

Results validated by an independent expert firm according to ISO 14020 and ISO 14021 standards.	Main competitors' base oils			
	EDC BASE OILS	EDC 250 BIOLIFE	HYDROTREATED KEROSENE	GTL BASE OILS
AROMATIC CONTENT IN DRILLING BASE FLUIDS	0.004%	0%	0.03%	0.026%
BTEX CONTENT IN DRILLING BASE FLUIDS	< 3.9 ppb	0 ppb	NC	NC
BIODEGRADABILITY (OECD 306) 28 DAYS MARINE WATER	78%	83%	64% to 67%	62%
LIFE CYCLE ANALYSIS IN KG CO ₂ EQ/T	+620	-1 767	+670	+5 800

WBM lubricant for a full performance package

Our lubricant fluidifies the processes and drastically enhances drilling performance offering a complete solution for complex drilling environments (horizontal or deviated wells).

	WBM BIOLUB
PROVEN FRICTION REDUCTION	<ul style="list-style-type: none"> • Significant reduction measured using different lubricity testers • Efficient in RDF, PHPA Glycol, etc
MAIN BENEFITS	<ul style="list-style-type: none"> • Compatibility with a wide range of additives + Monovalent & Divalent Brines • Resistant to multiple solid contaminations • Performant under challenging temperatures (proven from 80°F up to 260°F) • Lower operation costs



EDC RANGE CERTIFIED

ISCC Plus Certification ensures traceability of raw materials throughout the product lifecycle.

TotalEnergies Ecosolutions label, a TotalEnergies company standard developed in compliance with ISO 14020 and 14021 and verified by independent audit that recognises our most efficient solutions in terms of energy efficiency and environmental impact.

<https://specialfluids.totalenergies.com/en/our-hseq-commitments/our-certifications-and-standards/iscc-plus-certification>
<https://specialfluids.totalenergies.com/en/certifications/our-certifications-and-standards>



Case study: US land-based drilling operation

EDC Clean Fluid vs Diesel Fluid



BETTER TECHNICAL PROPERTIES	IMPACT ON OPERATIONS	DIRECT TECHNICAL BENEFITS
Higher Flash Point > 78°C (VS 40-50°C for Diesel)	➤ Lower Evaporation Daily evaporation reduced by 86%	➤ Reduced overall fluid losses Daily fluid losses reduced by 69%
Better mud properties Optimal efficacy of additives		
Boosted Rheology Optimized PV and YP values	➤ Improved drilling performance ROP boosted by 16%	➤ Reduced drilling duration Drilling duration reduced by 19%

HEALTH & ENVIRONMENT	DIRECT HSE BENEFITS
<ul style="list-style-type: none"> ▶ Lowest aromatic content on the base oil market (0.004%) ▶ Odourless, no skin damage ▶ Proven biodegradability ▶ Approved by national and local authorities 	<ul style="list-style-type: none"> ✓ Improved working conditions ✓ No health risk, better productivity ✓ No environmental risk ✓ Compatible with operations near residential areas

Proven Economic Benefits through Total Cost of Ownership (TCO) approach

EDC CLEAN FLUID VS DIESEL FLUID – SAVINGS PER WELL		
TECHNICAL BENEFITS	DIRECT ECONOMIC BENEFITS	GENERATED SAVINGS
Overall fluid losses reduced by 69%	➤ Cumulative cost of fluids for the entire duration of the drilling operations: Only +2% VS Diesel	➤ All inclusive well costs decreased by 15% (VS Diesel Fluids)
Drilling duration reduced by 19% (thanks to boosted ROP)		



They trust us

Russia - Service Contractor

“ We have opted for the EDC base oil for three reasons:

- Its low viscosity level in challenging temperature conditions
- Its very low aromatic content which optimizes safety and environmental aspects of our operations
- The reliability and customer oriented policy of TotalEnergies’ teams along our long-term partnership. ”

US - Service Contractor

“ Field data show that, when used under the same conditions, muds including EDC have a 23 to 54% higher penetration rate compared to diesel muds. ”

Mexico - Service Contractor

“ Switching from diesel fluids to EDC base oil allowed us to reduce HSE risks thanks to its much lower aromatic content. In addition the higher aniline and flash points of the EDC base oil combined with its stable rheological properties make it a clean fluid perfectly adapted to our technical requirements. ”

