

Wax & Asphaltene Control

Advanced chemistry to
ensure continuous oil flow

Indovinya is the global specialty chemical and surfactants division of Indorama Ventures. We are the leading EO producer in the Americas, with operations across 10 countries and 15 manufacturing locations.

Indovinya is rooted in chemistry, powered by people, driven by innovation, and guided by sustainability and community impact.

#1
Non-ionic surfactants
producer in the
Americas

#1
Supplier of Home
Care ingredients in
the Americas

#1
Leading supplier
in crop solutions in
the Americas

Footprint

- AMERICAS**
- Brazil
 - Mexico
 - USA
 - Uruguay
- APAC**
- Australia
 - China
 - India
- EMEA**
- Belgium



-  **15** Industrial Units
-  **7** Global R&D Centers
-  Presence in **10** Countries
-  Approximately **3,000** Employees

-  Industries Units
-  R&D and Tech Centers



Wax & Asphaltene

Deposition control

In the oil and gas industry, maintaining uninterrupted and safe fluid flow is vital to operational efficiency. Among the key challenges are wax and asphaltene deposits – petroleum compounds that can clog pipelines and equipment, restricting flow and increasing the risk of system failure.

Wax can crystallize in low-temperature environments leading to obstructions and reduced flow. On the other hand, asphaltenes can be destabilized and precipitate thereby fouling equipment due to changes in production conditions.

At Indovinya, **our laboratory is equipped to test and evaluate new chemical solutions** designed to address **flow assurance challenges**.

Test capability



MICROSCOPE

Optical microscope equipped with heating stage, enabling analyses for particle morphologies. It is used for evaluating chemical effects on wax and asphaltenes.



FLOCCULATION

Optical probe titration device detects the appearance of asphaltene particles. Optical methods define the starting point and evaluate flocculation at the micrometric level.



TURBIDITY

Evaluates the stability of emulsions and suspensions over time. It allows the study of turbidity, sedimentation and flocculation by transmission and scattering of light.



FLOW ASSURANCE CELL

A customized device to study wax and asphaltene deposition. For wax deposition, it monitor pressure change across the capillary. For asphaltene, it can study deposition by either packed-bed or capillary.



COLD FINGER

A recognized method for studying wax deposition in petroleum, allowing the evaluation of several formulations simultaneously.



DYNAMIC FLOW LOOP

One of the most rigorous laboratory test to simulate wax deposition in ducts, offering robust evaluation of wax inhibitors in the most demanding scenarios.



FLOW LOOP

The device tests fluids in heating and cooling cycles under high pressure, ensuring performance and stability of the formulation.

Wax control

Indovina offers a complete portfolio of advanced chemical technologies aimed at controlling parrafin/wax deposition. Our solutions are developed to act directly in the mitigation of the formation and accumulation of paraffins, ensuring the integrity of the systems, the continuity of the flow and operational efficiency.

Among the main products aimed at this challenge, the following stand out: **SURFONIC® OFP**, **FLWSOLVE®** and **ULTRAMINA®** – technologies engineered to meet different operating conditions and provide greater predictability,safetyandperformanceinprocesses.IndovinaalsohasPPD(PourPointDepressants)technologies, based on Modified alpha olefin-maleic anhydride copolymer, which reduce the minimum temperature at which the oil can flow, preventing paraffin blockages in cold environments and ensuring greater efficiency.

Product	Appearance (@ 68 °F)	Active Content (wt%)	Pour Point (°C (°F))	Flash Point (Closed cup, °C (°F))	Registration	
					US (TSCA)	CANADA (DSL/n- DSL)
ALKYLBENZENE SULFONATE-BASED						
SURFONIC® OFP 303	Dark liquid	60	-23 (-9)	23 (73)	✓	✓
SURFONIC® OFP 309	Dark liquid	60	-2 (-28)	35 (95)	✓	✓
SURFONIC® OFP 322	Yellow-amber liquid	60	-32 (-26)	8 (46)	✓	✓
SURFONIC® OFP 326	Dark liquid	60	<-34 (<-29)	9 (49)		
ETHOXYLATED TALLOW DIAMINE						
ULTRAMINA® DTA 70	Yellow-amber liquid	100	2 (36)	>93 (>200)	✓	✓
MODIFIED ALPHA OLEFIN-MALEIC ANHYDRIDE COPOLYMER						
FLWSOLVE® 430	Clear liquid	50	18 (64)	66 (150)	✓	✓
SURFONIC® OFP 359	Clear to Hazy liquid	41	-24 (-11)	63 (145)	✓	✓
SURFONIC® OFP 961	Tan to brown solid	82	47 (117)	79 (175)	✓	✓
SURFONIC® OFP 962	Tan to brown solid	82	52 (126)	79 (175)	✓	✓
SURFONIC® OFP 963	Tan to brown solid	82	47 (117)	79 (175)	✓	✓
SURFONIC® OFP 964	Tan to brown solid	82	52 (126)	79 (175)	✓	✓
SURFONIC® OFP 965	Tan to brown solid	82	47 (117)	79 (175)	✓	✓

SURFONIC® OFP 964

Smart control for uninterrupted flow at any temperature

SURFONIC® OFP 964 is an modified alpha olefin-maleic anhydride copolymer that reduces the pour point and improves the flow of paraffinic oils. Prevents wax deposition in production systems, ensuring continuous operation at low temperatures. It is a versatile additive that acts as a pour point depressant (PPD), wax dispersant, and flow improver in upstream operations.

Features



Wax crystal modifier compatible with multiple API grade oils



High efficiency in wax control even at low temperatures

Benefits

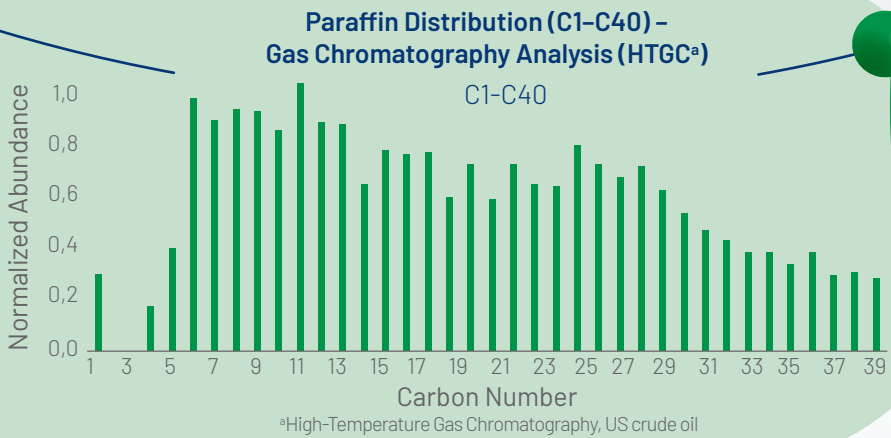


Reduce pour point and mitigate clogging

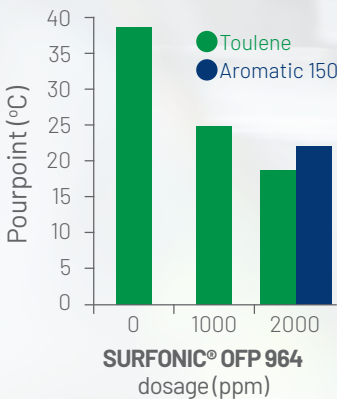


Remedy deposition and maintains system pressure

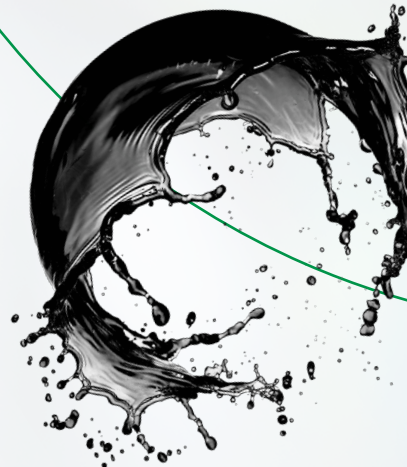
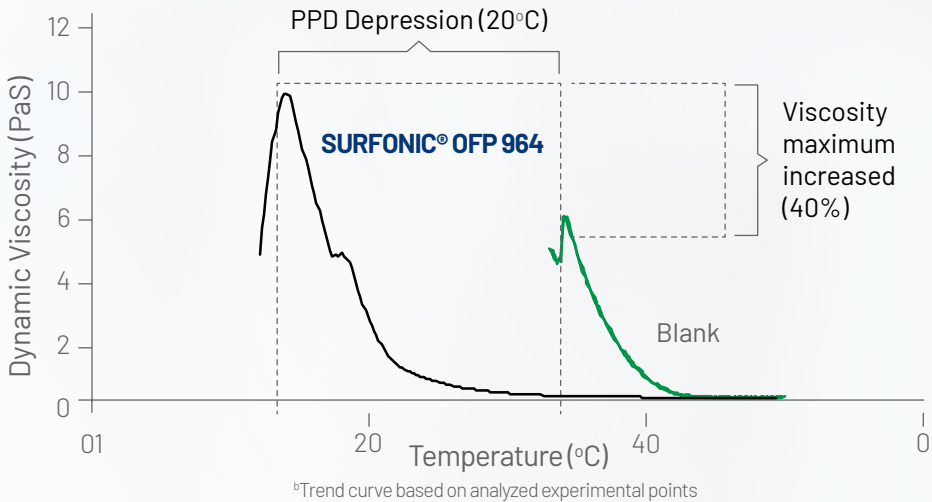
Performance tests



Cold filter plugging point (CFPP)



Viscosity-Temperature Profile – Pour Point Depressant Effect^b



Asphaltene control

Indovinya offers a comprehensive portfolio of solutions focused on the control and mitigation of asphaltenes deposition. Our technologies are designed to effectively mitigate the deposition and agglomeration of these compounds, ensuring system integrity and uninterrupted production.

Indovinya offers high-performance chemical solutions designed to treat the impacts caused by asphaltenes. Our portfolio includes technologies such as **FLWSOLVE®**, **SURFONIC® OFA**, **LAVREX®**, and **XOF** – each tailored to meet the specific needs of different operations. With these solutions, Indovinya positions itself a strategic partner in overcoming production challenges.

Product	Appearance (@ 68 °F)	Active Content (wt%)	Pour Point (°C (°F))	Flash Point (Closed cup, °C (°F))	Registration		
					EU (REACH)	US (TSCA)	CANADA (DSL/n- DSL)
ALKYLBENZENE SULFONATES (ANIONIC)							
LAVREX® 200 BP	Clear brown liquid	97	-12 (10)	149 (300)		✓	✓
XOF 26A	Dark liquid	90	12 (54)	149 (300)		✓	✓
XOF 30A	Dark liquid	90	-20 (-4)	175 (347)		✓	✓
PIBSA-ALKANOLAMINE CONDENSATE							
SURFONIC® OFA 2524	Clear amber liquid	100	-2 (28)	137 (278)		✓	✓
POLYMER							
SURFONIC® OFA 830	Dark liquid	50	-50 (-58)	21 (70)			
POLYOLEFIN ESTER							
FLWSOLVE® 150	Clear brown liquid	50	-81 (-115)	70 (150)		✓	✓
FLWSOLVE® 110 LN	Clear brown liquid	50	-27 (-17)	61 (142)	✓	✓	✓
FLWSOLVE® 113 LN	Clear brown liquid	50	-27 (-17)	61 (142)	✓	✓	✓
FLWSOLVE® 212 LN	Clear brown liquid	50	-27 (-17)	61 (142)	✓	✓	✓
FLWSOLVE® 250 AF	Clear brown liquid	50	<-4 (<25)	130 (266)	✓	✓	✓
VEGETABLE-BASED SURFACTANT (NON-IONIC)							
SURFONIC® VBS D-10	Clear liquid	100	-20 (-4)	105 (221)		✓	✓

FLWSOLVE® 110 LN

Low dosage, high impact: Engineered for reliable flow assurance

FLWSOLVE® 110 LN is a medium molecular weight heteroatom-free polyolefin ester. It is designed as an effective asphaltene control agent with very low product pour point at 50% active. The product improves flow efficiency in oil production operations.

Features



Low foam and emulsion tendency



Very low pour point for better handleability

Benefits



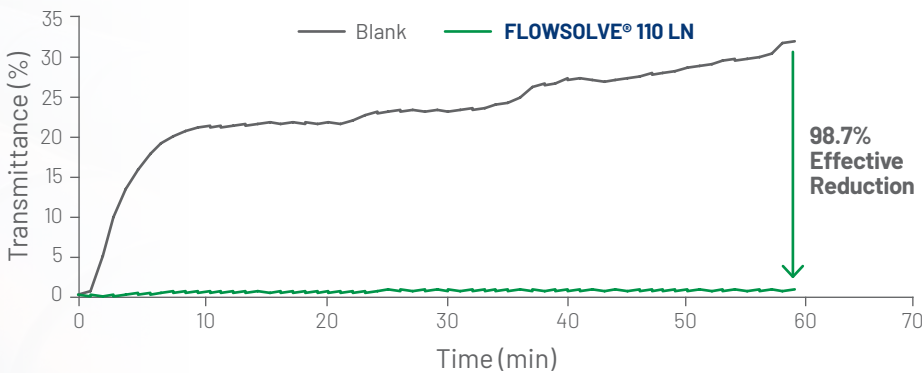
Reduces chemical consumption, lowering costs



Versatile Performance in different conditions

Performance tests

Turbiscan analysis¹



¹1h Turbiscan studies (0.7 mL crude oil added to 24.3 mL heptane). Crude oil was heated at 70 °C for 6 Hrs before treated with 150 ppm of **FLWSOLVE® 110 LN** (conc. based on 0.7 mL). Then heated overnight before test. Scan program: 1 scan/min for 1h.

Table 1. Crude oil properties (Middle east crude)

Parameter		Value
SARA (IP-143)	Saturates	43.5%
	Aromatics	42.6%
	Resins	10.4%
	Asphaltenes	3.4%
	°API	37
Density (g/cm³)		0.84
Carbon Intensity Index (CII)		0.885

Table 2. Turbiscan Seperability¹

Entry	Traditional Turbiscan Seperability ^a
Blank	6.38
FLWSOLVE® 110 LN	0.02

^aDimensionless. Relative index based on optical variations (transmittance and backscatter) over time.

Deposition analysis

Table 3. Deposition device results²

Entry	Packed bed ^b	Capillary ^c
Blank	187mg	87mg
FLWSOLVE® 110 LN	89mg	30mg
Reduction in deposition	-52%	-66%

²Oil sample handled in the same way as Turbiscan test. Both deposition tests were conducted at 70 ± 5 °C throughout the experiment (20 h). The total flow rate was 9 mL/h with 30% crude oil and 70% heptane. Cyclohexane was used for removing residual oil.

^bThe packed-bed column was a stainless tube 5" in length and 1/2" OD (0.083" wall), filled with 1.5 mm diameter beads with permeability 423 Darcy. Test operated at 100 psi back-pressure.

^cThe capillary is 100 ft long 1/16" OD x 0.030" ID stainless steel tube. Tested at 50 psi back-pressure.



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