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Petroleum Flow Facilitator®

Transforming viscosity into fluidity for efficient transport of heavy and extra-heavy crudes.

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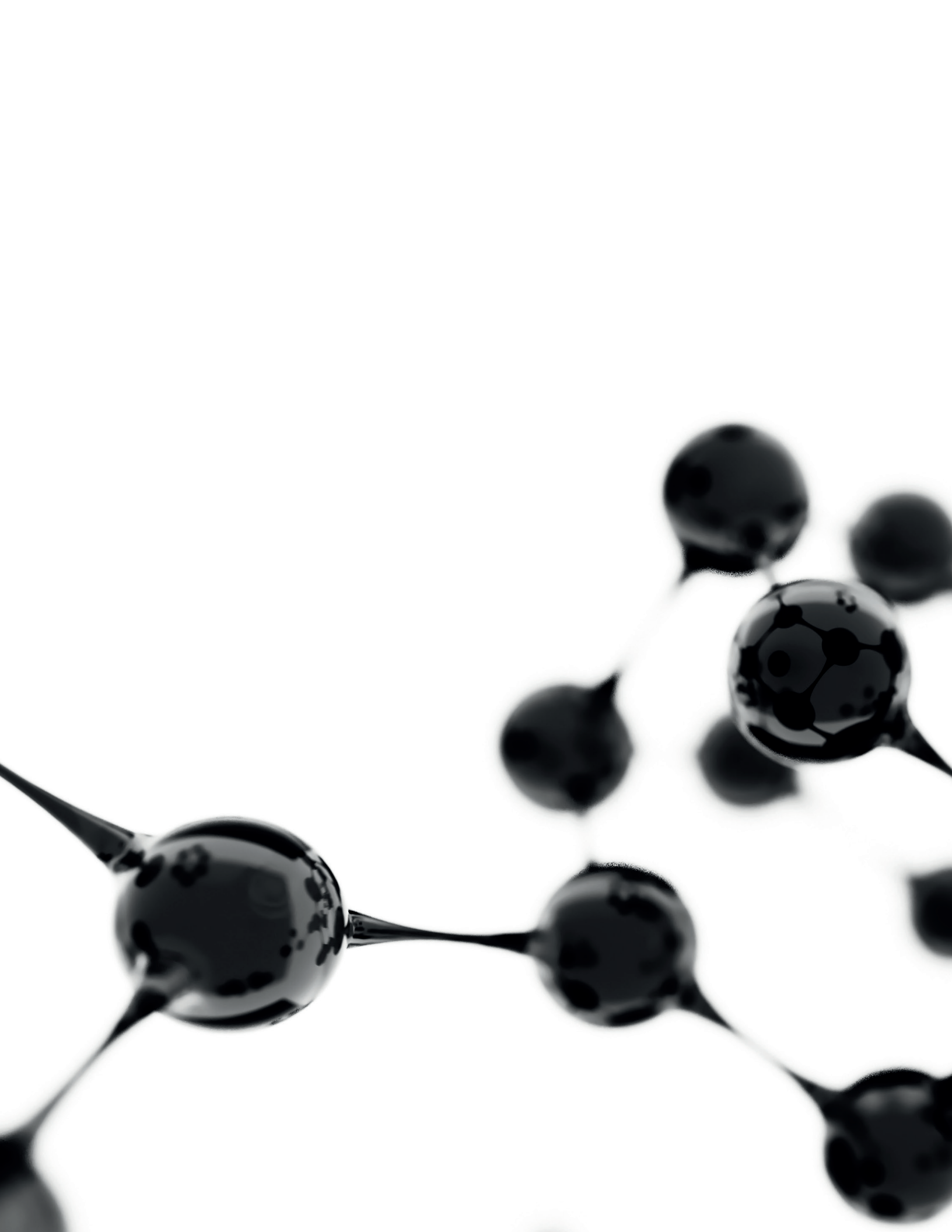


Petroleum Flow Facilitator®

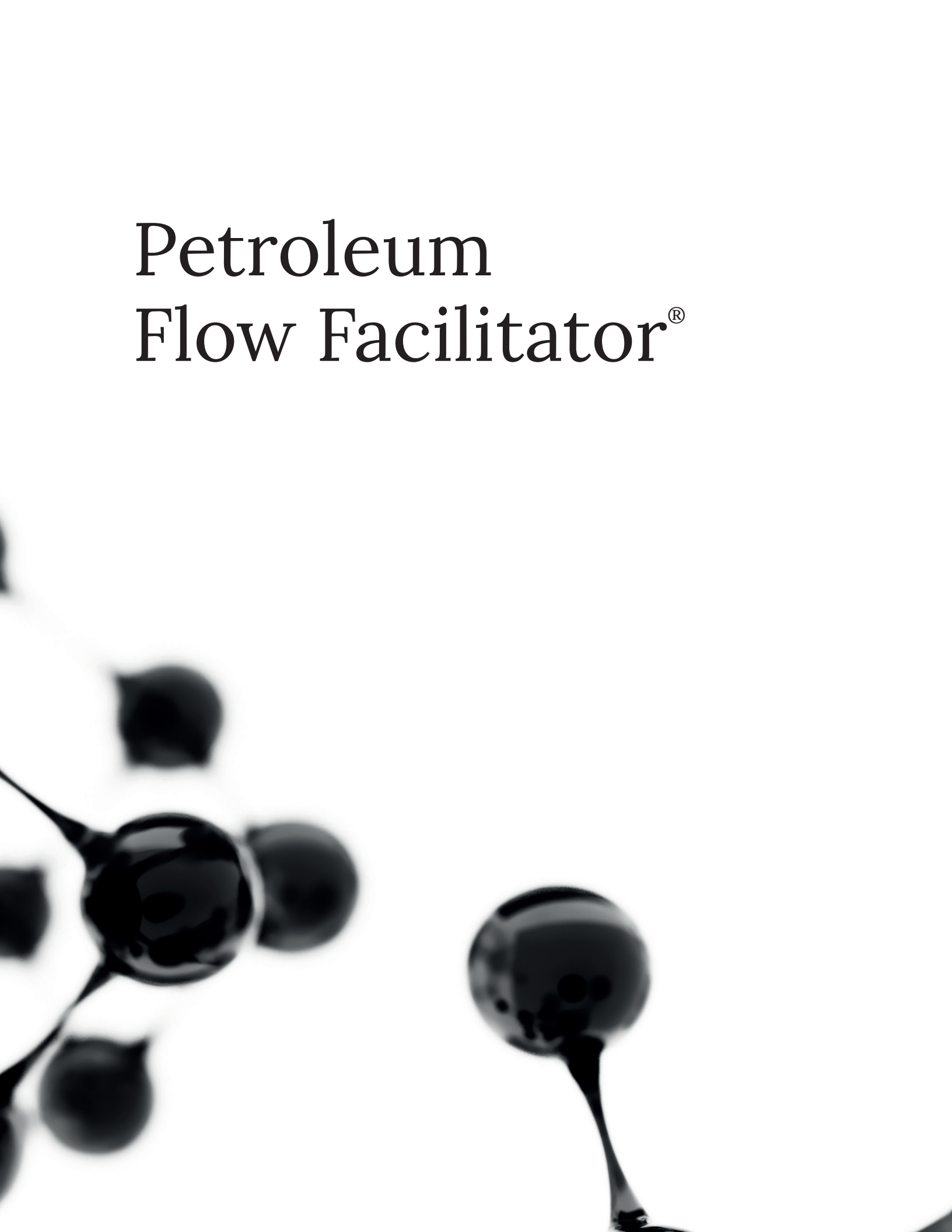


Table of Contents

Forewords.

Dear reader,

We are pleased to present this publication dedicated to a revolutionary innovation in the oil industry: the Heavy and Extra Heavy Crude Petrol Flow Facilitator® (P.F.F.®). In a world where operational efficiency and environmental sustainability are more crucial than ever, the P.F.F.® stands out as a pioneering solution addressing the most pressing challenges in the energy sector.

Heavy and extra heavy crude oil represents a significant proportion of the world's hydrocarbon reserves. However, its high viscosity and the complex processes required for its extraction, transportation, and refining have historically been obstacles to its profitable exploitation. Aware of these challenges, we have developed the P.F.F.®, a technology that promises to transform the way we manage these valuable resources.

In the following pages, we will explore in detail the unique properties of the P.F.F.® and how this innovative additive can significantly improve every stage of the heavy crude oil value chain. From reducing viscosity to protecting infrastructure, to environmental sustainability and cost efficiency, the P.F.F.® offers a range of benefits that position it as a paradigm shift in the industry.

Our goal with this publication is not only to inform but also to inspire companies and professionals in the sector to consider new and better ways of operating. The P.F.F.® is not just a product; it is a promise of progress and a commitment to a more efficient and eco-friendly future.

We appreciate your interest and hope that the information presented here will be of great use to you in understanding the advantages and potential of the P.F.F.®. We are convinced that by adopting this technology, the oil industry can move towards a new era of productivity and sustainability.

José A. Pereira Ruimwyk
CEO of Intensaoil

Strengths and Claims.

1. Reducer of the adverse effects of viscosity. If viscosity is understood as the resistance of a liquid to flow, P.P.F.®, through its lubricating action, significantly reduces friction and therefore increases the kinematic velocity of the crude, facilitating its flow, which is ultimately the most critical factor in both extraction and pipeline transport.

2. Dehydration. The bipolar nature of the P.F.F.® allows the separation of the "associated water" from the crude oil, since the free water (1%) decants by gravity when the crude oil rests; On the other hand, the "associated water" in the form of droplets and being immiscible with the oily part of the crude forces it to be separated, since the expansion of water into steam is approximately 1500 times or more its volume, causing explosive pressure processes within refinery tower trays. This process requires demulsifiers and high voltage to induce condensation into liquid form, allowing it to decant as droplets by gravity.

Process	With Catalytic Naphtha	With P.P.F
Dehydration	Requires high voltage and expensive chemicals.	Fast and natural (decantation).
Diluent Separation	Mandatory: Furnace and Distillation (Costly).	Nonexistent: Isothermal Decantation (Free).
Recovery	80% - 90% (Money is lost).	100% (Total efficiency).
Time	Hours or days of process.	10 to 15 minutes.

3. Asphaltene Encapsulation. The P.F.F.® forms a coating barrier on asphaltenes, solid components in crudes, boosting the capillarity of residual crude trapped in rock pores, significantly enhancing its flow from the crude bank to production pits. Its application is vital in oil spill processes in lakes and oceans.

4. Bipolar Molecular Technology. The bipolar nature of P.F.F.® includes hydrophilic and hydrophobic components, giving it unique properties in altering crude emulsions. This bipolar nature of the P.F.F.® allows the separation of the "associated water" from the crude oil, since the free water (1%) decants by gravity when the crude oil rests; On the other hand, the "associated water" being in emulsified form in drops and being immiscible with the oily part of the crude oil entails an expensive process called "dehydration of the crude oil". This is another advantage of our P.F.F.® .

5. Self-Cleaning. The P.F.F.® possesses self-cleaning and sliding properties in pipeline systems, reducing the buildup of residues and deposits that can impede crude flow and cause blockages.

6. Versatile. Emulsion experts even recommend using the P.F.F.® for light and semi-light crude extraction to address abrupt changes in crude viscosity.

The P.F.F.® is an integral tool that effectively addresses multiple challenges in the oil industry, from extraction to transportation and processing, improving operational efficiency and contributing to sustainability and profitability in handling heavy and extra-heavy crudes.

Micellar Phenomenology Interaction.

In the vast and complex oil industry, where efficiency in the extraction, transportation, and processing of heavy and extra-heavy crude is crucial, understanding microscopic phenomena is essential. In this context, the interaction of the Heavy and Extra-Heavy Petroleum Flow Facilitator® in micellar phenomenology emerges as a key field of study.

"This brief analysis will delve into the dual molecular structure of the P.F.F.®, exploring how its amphiphilic(*) nature and its ability to organize micelles influence the reduction of interfacial tension, stabilization, and controlled destabilization of oil emulsions. This knowledge is fundamental for understanding how the P.F.F.® can adapt to variable conditions, offering a versatile tool in optimizing petroleum processes."

(*) An amphiphilic molecule has both hydrophilic (water-attracting) and hydrophobic (water-repelling) regions.

The *P.F.F.®*, as referenced, possesses a dual molecular structure, characterized by hydrophilic and hydrophobic regions. This duality grants the *P.F.F.®* amphipathic properties, meaning it can interact with both aqueous and oily components of the emulsion.

1. Micellization of the P.F.F.®: In the presence of an oil emulsion, *P.F.F.®* molecules tend to organize into micelles. These micelles are colloidal structures where hydrophilic regions orient towards the aqueous phase of the emulsion, while hydrophobic regions direct towards the oil droplets. This micellar organization is essential for the stabilization and controlled destabilization of emulsions.

2. Reduction of Interfacial Tension: The duality of the *P.F.F.*® allows micelles to reduce the interfacial tension between the aqueous and oily phases of the emulsion. By interacting with water molecules and hydrocarbons present in the oil, the *P.F.F.*® diminishes the forces holding emulsified oil droplets, thus facilitating the controlled rupture of the emulsion.

3. Stabilization of Soft Emulsions: The presence of *P.F.F.*® with its dual structure contributes to the formation of soft emulsions, especially water-in-oil (W/O) type. The hydrophilic regions of *P.F.F.*® interact with water, while hydrophobic regions associate with hydrocarbons. This stabilization facilitates the controlled destabilization of the emulsion when necessary.

4. Destabilization of Hard Emulsions: In conventional oil emulsions, *P.F.F.*® molecules act on asphaltene particles and other components contributing to the formation of hard emulsions. By encapsulating these particles and modifying their properties, *P.F.F.*® promotes the controlled destabilization or breaking of emulsions, transforming them into larger particles that can settle more easily.

5. Adaptability to Variable Conditions: The duality of *P.F.F.*® confers high adaptability to variable conditions. It can be adjusted to interact efficiently in oil emulsions with diverse characteristics, making it versatile in changing oil production environments.

In summary, the hydrophilic and hydrophobic duality of P.F.F.® plays a key role in its interaction with petroleum emulsions. From micelle formation to the reduction of interfacial tension and controlled destabilization of emulsions, this duality provides a powerful tool for improving efficiency in the separation of aqueous and oily phases in petroleum production processes.

Ecological Qualities.

In the oil industry, the Heavy and Extra Heavy Petroleum Flow Facilitator® stands out for its sustainability. Its biodegradability, lower toxicity, reduced carbon footprint, and ecological adaptability differentiate it from conventional products such as catalytic naphtha and gasoline. Additionally, it complies with environmental regulations and offers a cost-effective and environmentally friendly alternative.

1. Biodegradability. Unlike catalytic naphtha and other conventional products commonly known as "surfactants," *P.F.F.®* exhibits higher biodegradability. Its molecules tend to break down more easily into simpler components through natural processes, reducing long-term environmental impact.

2. Reduced Toxicity. *P.F.F.®* is designed with an eco-friendly approach, minimizing the presence of toxic chemicals. In contrast, catalytic naphtha and other additives may contain harmful substances that, in the event of leaks or spills, can have negative consequences for the environment and human health.

3. Lower Contribution to Greenhouse Gases. The production and use of *P.F.F.®* are designed to have a reduced carbon footprint compared to conventional products. In contrast, catalytic naphtha and other surfactants significantly increase greenhouse gas emissions during their production and application.

4. Recyclability. A key advantage of *P.F.F.®* is its recyclability. It can be recovered almost entirely before entering the refinery and reused, reducing the reliance on new resources and minimizing waste associated with other crude treatment products.

5. Lower Natural Resource Consumption. The formulation of *P.F.F.®* is geared towards efficient use of natural resources. Similar products often require up to 30% more to achieve comparable effects, significantly increasing resource demand and energy consumption in production and subsequent operational costs.

6. Adaptability to Sensitive Ecosystems. Due to its environmentally friendly formulation, *P.F.F.®* can be a safer and more adaptable option in ecologically sensitive environments. Its use in areas near water sources or vulnerable habitats helps minimize the risk of contamination, particularly in the event of spills into aquatic resources.

7. Compliance with Environmental Regulations. *P.F.F.®* is designed in compliance with environmental regulations and standards. Its use can assist companies in meeting legal requirements and adopting more sustainable practices, providing an advantage in the current regulatory landscape.

In summary, the ecological qualities of P.F.F.®, including its biodegradability, lower toxicity, reduced contribution to greenhouse gases, recyclability, and adaptability to sensitive ecosystems, position it as a more sustainable alternative compared to traditional products mentioned earlier. These characteristics can be crucial for companies seeking to improve their environmental footprint and meet increasingly stringent sustainability and profitability standards

Rheological Control and Fluid Dynamics Optimization in Heavy Crude Oil.

> *"Rheological Control" refers to managing the flow and deformation properties of a fluid. In the context of the petroleum industry, particularly when dealing with heavy crude oils, rheological control is critical to ensuring efficient transportation from the reservoir to the refinery. The addition of P.F.F.® serves as a facilitating agent, positively influencing the optimization of fluid dynamics at various stages of the process.*

1. The *P.F.F.®* has a direct positive impact on reducing the factors causing high viscosity in heavy and extra-heavy crude oils. By interacting with their short chains alongside the longer hydrocarbon chains, particularly with asphaltenes, the *P.F.F.®* acts as a viscosity modifier, favorably altering the factors that hinder crude flow through lengthy pipelines. This prevents obstruction and minimizes the impact on valves, pumps, among other components, ensuring smooth and efficient operations in pipelines towards refineries or shipping ports.

2. The *P.F.F.®* induces an encapsulation effect on asphaltenes found in heavy crude oils, forming a protective coating that isolates and controls their viscosity and density. This optimization enhances crude deformation, facilitating a smoother and more efficient flow. Moreover, this encapsulation effect accelerates the isolation of spilled crude in water systems.

3. The rheological control provided by *P.F.F.®* is particularly beneficial when dealing with crude oils that exhibit significant viscosity changes, ranging from light to heavy and extra-heavy grades. It stabilizes the shear stress of the crude, ensuring a consistent dynamic velocity and mitigating issues associated with sudden surges in viscosity.

4. Sostenibilidad. In addition to its rheological control impact, *P.F.F.®* stands out for its recyclability, exceeding 90%. This sustainable attribute contributes to environmental optimization and profitability benefits by reducing dependence

5. Efficiency in Various Stages of the Process. From the injection of *P.F.F.®* into the well of the crude or at its mouth and everything related to its transportation to the refinery or shipping ports, *P.F.F.®* maintains its effectiveness in multiple stages of the process. Its ability to adapt to various conditions and its positive effect on the rheology of heavy crude make it a versatile facilitating agent.

In summary, the Rheological Control provided by P.F.F.® translates into a comprehensive optimization of fluid dynamics in the petroleum industry. From reducing the phenomena that generate its high viscosity to improving efficiency in pipelines, this facilitating agent not only simplifies and streamlines the transportation of heavy and extra-heavy crude, but also contributes to the sustainability and profitability of this industry.

Asphaltene Encapsulation: A molecular and bipolar approach.

"The P.F.F.® plays a critical role in asphaltene encapsulation, operating at both the molecular level and in terms of the bipolarity of its molecule. This complex phenomenon is essential for controlling the adverse factors of viscosity in the flow of heavy and extra-heavy crude oils and managing sudden changes in viscosity even when extracting light or medium crudes, optimizing their flow and transport in the petroleum industry."

1. Molecular Encapsulation: At a molecular level, the P.F.F.® exhibits a unique structure that enables it to interact with crude oil components, particularly with asphaltenes. Asphaltenes, known as solid hydrocarbons with high molecular weight, are directly responsible for the high viscosity and density of heavy crude oils. The P.F.F.® acts as an encapsulating agent by forming a lubricating molecular barrier around the asphaltenes.

In terms of granularity, the P.F.F.® demonstrates exceptional ability to penetrate the complex molecular structures of asphaltenes. Its molecular properties enable the formation of a

protective layer around the asphaltenes, inhibiting their ability to aggregate and impact the adverse mobility factors due to the high viscosity of heavy and extra-heavy crude oils.

2. Bipolarity of the P.F.F.® Molecule: The bipolarity of the *P.F.F.®* molecule (O/W+W/O) is fundamental to its function as an encapsulating agent. This bipolarity refers to the presence of hydrophilic and hydrophobic components in the *P.F.F.®* molecule. This duality allows the *P.F.F.®* to interact with both the aqueous and oil phases present in the crude oil.

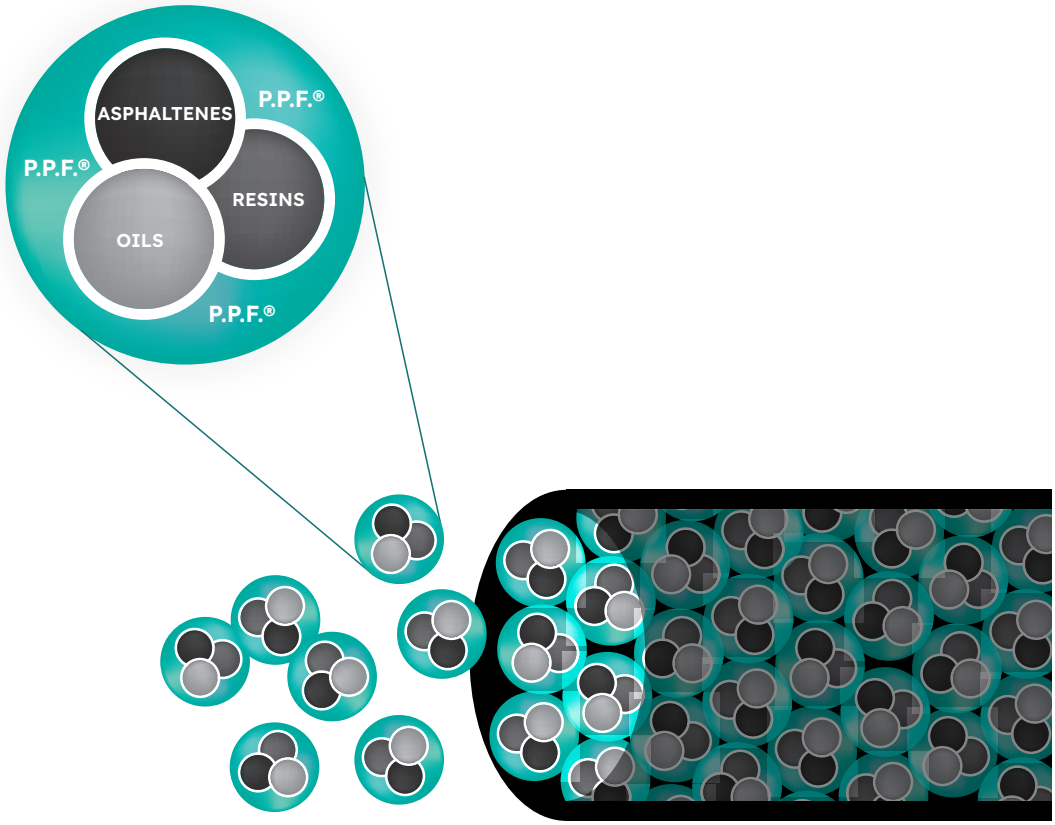
3. Interaction with Asphaltene Components: The hydrophobic components of the *P.F.F.®* have an affinity for asphaltenes, which are inherently nonpolar. This interaction results in the formation of a protective layer surrounding the asphaltenes, reducing their capacity to decrease the flow rate of heavy crude oils.

4. Action at the Oil-Water Interface (O/W): The bipolarity of the *P.F.F.®* also plays a key role in stabilizing the oil-water interface. By acting on the oil emulsion, the *P.F.F.®* smoothens the transition from a "hard" (O/W) emulsion to a softer and easily breakable form (W/O). This facilitates the extraction of free water from the crude by the aqueous molecule of the *P.F.F.®*, and thus its separation from the crude in the refining station.

In conclusion, the P.F.F.® initiates its action at a molecular level by encapsulating the asphaltenes and controlling their granularity. Its bipolarity (O/W) allows for efficient interaction with crude components, providing rheological control that optimizes fluid dynamics in heavy and extra-heavy crude oils. This molecular and bipolar approach underscores the versatility and effectiveness of the P.F.F.® as a facilitating agent in the petroleum industry.

Thermo-resistant characteristics and energy savings in crude oil transportation.

The proper functioning of P.F.F.® regardless of the operational temperature is based on several thermo-resistant characteristics and specific properties of its formulation. These features not only enable effective action over a wide range of temperatures but also contribute significantly to energy savings in the transportation of heavy and extra-heavy crude oil.



Theres some of the product relevant features.

1. Low Freezing Point: *P.F.F.®* is engineered with a significantly low freezing point. This property is essential to ensure that *P.F.F.®* maintains its fluidity and effectiveness even in extremely low temperature conditions. The specific formulation of *P.F.F.®* prevents solidification at low temperatures, ensuring consistent performance in cold environments.

2. Chemical Stability: The chemical stability of *P.F.F.®* is crucial for its resistance to varied operating conditions. Regardless of temperature fluctuations, *P.F.F.®*maintains its chemical properties without significant degradation. This ensures consistent action in encapsulating asphaltenes and reducing the adverse factors that contribute to the viscosity of the crude oil throughout the extraction, transportation, and separation process at the refining station.

3. Adaptability to Temperature Variations: *P.F.F.®* exhibits a heat-saving capacity within the reservoir, acting favorably on both its own accelerated heat losses and those supplied to it. This is essential to ensure optimal flow of heavy crude in environments where high-temperature increases are a common strategy to reduce crude viscosity, which would otherwise incur high costs.

4. Energy Savings: The use of *P.F.F.®* leads to significant energy savings in the transportation of heavy and extra heavy crude oils. This saving mainly comes from the substantial reduction in the energy required to heat the pipes used in conventional transportation processes. By encapsulating the asphaltenes and reducing the adverse factors affecting crude oil viscosity, *P.F.F.®* facilitates more efficient flow through the pipes, reducing the need for constantly applying high temperatures to maintain crude oil kinematic velocity.

This significant reduction in adverse viscosity factors provided by *P.F.F.®* at normal operating temperatures eliminates the reliance on energy-intensive processes, such as partial or continuous pipe heating. The reduction in energy consumption not only brings economic benefits but also aligns the use of *P.F.F.®* with more sustainable and environmentally friendly practices in the oil industry, controlling its toxic emissions.

In summary, the thermoresistant characteristics of P.F.F.® and its ability to operate efficiently over a wide range of temperatures significantly contribute to the product's performance and consistent profitability. Furthermore, the resulting energy savings from pipe heating represent a notable economic and environmental advantage in the transportation of heavy and extra-heavy crude oil.

Comparative advantages of the P.P.F.®

"The application of the Heavy and Extra Heavy Petroleum Flow Facilitator® presents notable comparative advantages over conventional surfactants and diluents used in the oil industry. These advantages stem from the unique bipolar (O/W+W/O) properties of the P.F.F.® and its ability to effectively address the challenges associated with heavy and extra heavy crudes."

Here, key differences are analyzed:

1. Bipolar Action and Emulsion Stabilization. The *P.F.F.®* exhibits a unique bipolar action due to the presence of water/oil components in its formulation. This characteristic efficiently and controllably destabilizes hard emulsions of heavy and extra heavy crudes, transforming them into softer and easier-to-break emulsions (W/O). Unlike some conventional fluidizers, the *P.F.F.®* not only improves crude mobility but also facilitates water separation, allowing for recycling.

2. Efficiency in Reducing Adverse Viscosity Factors. Compared to conventional diluents or surfactants, the *P.F.F.®* stands out for its efficiency in encapsulating asphaltenes, controlling rheology, and reducing friction in pipelines to ensure optimal crude flow. This results in lower energy expenditure for shear stress during transportation, unlike some fluidizers that may show limitations in fluid dynamics optimization.

3. Recyclability and Low Usage Percentage. The *P.F.F.®* stands out for its recyclability and the need to add only a fraction of the percentage required by some conventional fluidizers. While in some cases up to 30% of traditional diluents are used, the P.F.F.® demonstrates its effectiveness with a saving addition of almost 80% compared to these, thus contributing to increased profitability in the oil business in its extraction and transportation phases in the oil industry.

4. Adaptability to Sudden Viscosity Variations. The beneficial action of the *P.F.F.®* remains constant even when working with lower viscosity crudes such as light or medium ones, avoiding blockages, pressure effects on pumps, valves, bends, loading lines, nozzles, among others, and pipe obstructions. Unlike almost all surfactants or viscosity reducers that are unable to cope with difficulties when flow characteristics change, the *P.F.F.®* maintains its effectiveness, regardless of the sudden variation in crude viscosity.

5. Environmental Impact. In terms of sustainability, the *P.F.F.®* offers notable ecological advantages compared to some traditional surfactants and fluidizers, such as catalytic naphtha. The low viscosity and density of the *P.F.F.®* and its ability to reduce the need to heat pipes contribute to lower energy consumption, aligning with more environmentally friendly practices.

Its property to act in isolating crudes in oil spills will mark a before and after in the way this problem is addressed and its effects on the environment.

> *In summary, the comparative advantages of P.F.F.® over conventional diluents focus on its bipolar action, efficiency in addressing high viscosity factors, recyclability, adaptability, and lower ecological impact. These characteristics will position P.F.F.®as a comprehensive, advanced, cost-effective, and more sustainable solution for optimizing fluid mechanics processes in the extraction, transportation, and refining in the petroleum industry.*

Antioxidant properties.

"A *Detailed Approach to Crude and Infrastructure Protection.*"

> *The Heavy and Extra Heavy Petroleum Flow Facilitator® stands out not only for its ability to improve the flow and fluidity of heavy and extra heavy crudes, but also for its significant antioxidant properties. These properties not only benefit the integrity of the crude oil, but also offer innovative solutions to the challenges associated with corrosion and oxidation in transportation infrastructure.*

1. Antioxidant Action in Crude Oil: The *P.F.F.®* acts as an antioxidant agent in crude oil, preventing degradation and associated challenges that increase the viscosity of heavy hydrocarbons.

2. Protection of Infrastructure: The *P.F.F.®* not only protects crude oil against oxidation

but also prevents corrosion in pipeline infrastructure, counteracting the harmful effects of this corrosive environment without generating contaminating substances.

3. Self-Cleaning Pipelines: The *P.F.F.®* also offers self-cleaning capabilities in pipeline systems by preventing the accumulation of residues and contaminants. In contrast to costly conventional methods, the *P.F.F.®* provides a more efficient and cost-effective solution.

4. Cost Reduction and Sustainability: The *P.F.F.®* reduces costs by protecting both crude oil and infrastructure. By decreasing corrosion and oxidation in pipelines, maintenance and replacement expenses are reduced, promoting sustainability by minimizing the need for aggressive chemical treatments and equipment.

5. Positive Environmental Impact: It reduces the environmental impact associated with conventional treatment and cleaning methods. As a more eco-friendly solution, the *P.F.F.®* strengthens its position as an advanced and sustainable technology in the oil industry.

Factors Influencing the Profitability of Heavy Crude Oil.

Only the large volume of heavy crude oils, extra-heavy oils, and bitumens, representing around 80% of the world's reserves (almost 10 trillion barrels), justifies the multimillion-dollar investments being made by oil consortia and investors. The main challenge to overcome is definitely their very high viscosity (10° API or below), coupled with the fact that each reservoir has different morphological conformations that, among other variables, require rheological studies, and in all this, the solution is to make it flow within profitability parameters.

In this direction, the most varied techniques and the use of substances that facilitate both their extraction and transportation to refining stations have been developed.

Below is a summary of this problem, its factors, methods, additives, among others, and what leads us to the most important thing, proposing its definitive solution, the *P.F.F.®*

We know for a fact that extraction, transportation, and refining costs significantly influence the price per barrel of oil produced. The predominant factors that significantly affect its profitability are very varied: such as the quality of the crude oil, geographical location, energy consumption, compliance with environmental standards, safety, and the complex processes that crude oil is subjected to before entering the refining towers such as:

• Steam injection into reservoirs to reduce the viscosity and mobility of crude oil and other accompanying fluids. This steam injection is often done for several months.

• Installation of fiber optic heat meters in wells and reservoirs in order to carry out different analyses to determine their temperature fluctuations.

• Chemical analysis of crude oil molecular chains, including techniques such as chromatography and infrared, requires constant monitoring due to the diversity of reservoirs, which can lead to errors in measurements.

• Removal of free water at the primary station of refineries, including the addition of salts to crude oil in many cases to destabilize hard emulsions (crude).

• Desalination, even though a part of it is done in separation batteries near the reservoir.

• Hydrodesulfurization and cracking, catalytic additives and isomerization, alkylation, among others, which represent investments that continuously affect profitability, in addition to unforeseen factors and fluctuations in input and equipment costs.

• Separation of heavy metals and other substances present in heavy and extra-heavy crude oil.

Among these methods and techniques, we can highlight:

1. Diluents, such as catalytic naphtha, gasoline, kerosene, light crude, among others, where the percentage ranges around 30% per barrel of transported crude.

2. Viscosity reducers and fluidizers.

3. Pumping system techniques (electric submersible pumps and progressive cavity pumps).

4. Cold techniques, with sand or water, highly criticized for producing very poor sweeps.

5. On-site combustion method, aiming for the molecular separation of the oil emulsion, but which in many cases result very unstable, alongside other variants such as vertical and horizontal injectors.

6. Hybrid processes (cold, cyclic stimulation, and displacement with steam), gas injection such as CO_2

7. High energy consumption, always fluctuating to extract and transport.

8. Constant application and monitoring of environmental and safety regulations, maintenance of facilities and equipment.

Costs and profitability.

The usual diluents for heavy and extra-heavy crude, such as catalytic naphtha or gasoline, constitute 30% of the crude oil barrel. However, current methods and surfactants do not meet performance expectations regarding the investment.

Regarding this diluent, catalytic naphtha and *P.F.F.®*, we will conduct a cost exercise:

CATALYTIC NAPHTHA

Average global cost (increasing trend, geopolitics): 75 USD/barrel
Dosage: 33% per processed barrel
Approximate recovery: 80–90%
Additional recovery process cost: 2 USD/barrel

For 100,000 barrels/day:
Total cost: (75 + 2) USD/barrel × (33/100) × 100,000 barrels = 2,541,000 USD
Unit cost per processed barrel: 2,541,000 / 100,000 = 25.41 USD/barrel

P.F.F.®

Average global cost (downward trend): 76.47 USD/barrel
Dosage: 10% (improvable)
Recovery: 100%
Recovery cost: 0 (simple gravitational decantation)
Decanting time: 10 to 15 minutes (isothermal)
Additional recovery process costs: 0

For 100,000 barrels/day:
Total cost: 76.47 USD/barrel × 10/100 × 100,000 barrels = 764,700 USD
Unit cost per processed barrel: 764,700 / 100,000 = 7.65 USD/barrel

Profitability Difference

= Naphtha cost/barrel –P.F.F.® cost
= 25.41 – 7.65 = 17.76 USD/barrel

For 100,000 barrels/day:
17.76 × 100,000 = 1,776,000 USD/day

Profit for company and investors per day: 25%
1,776,000 × 25/100 = 444,000 USD/day

Daily Production (Barrels)	Naphtha Operating Cost (Day)	P.P.F. Operating Cost (Day)	Total Savings (Daily Difference)	Intensa Profit (25% of Daily Savings)
100,000	$2,541,000 **USD**	$765,000 **USD**	$1,776,000 **USD**	$444,000 **USD**
200,000	$5,082,000 **USD**	$1,530,000 **USD**	$3,552,000 **USD**	$888,000 **USD**
500,000	$12,705,000 **USD**	$3,825,000 **USD**	$8,880,000 **USD**	$2,220,000 **USD**
1,000,000	$25,410,000 **USD**	$7,650,000 **USD**	$17,760,000 **USD**	$4,440,000 **USD**
3,000,000	$76,230,000 **USD**	$22,950,000 **USD**	$53,280,000 **USD**	$13,320,000 **USD**
10,000,000	$254,100,000 **USD**	$76,500,000 **USD**	$177,600,000 **USD**	$44,400,000 **USD**

The implementation of P.F.F.® in the heavy and extra heavy crude oil transportation sector represents a savings of between 90~95% compared to traditional diluents.

Apart from the quantity of advantages that can be analyzed in the brochure, the comparison between these figures is compelling. These advantages, logically, do not depend on the number of barrels processed; they can be 10 thousand, 50 thousand, 100 thousand, etc.

Expert opinions coincide, due to the characteristics of P.F.F.®, that it can be perfectly injected into the wells without the need for equipment different from those used in surfactants, since its low density of 1.13 kg/m3; furthermore, where the high temperatures of the reservoir will increase its advantages.

"Scan the QR code to play on your mobile device
the demonstrative video of the flow-enhancing properties of the P.F.F.®"

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Innovation & Technology
on Super Aditives