

**REPA**  
Paraffin inhibitors



Additives  
for oil production



## PARAFFINS IN OIL PRODUCTION

Paraffins are defined as the distribution of linear alkanes of the formula  $C_nH_{2n+2}$  with  $n=18$  to  $80$ . They are behind several phenomena causing production problems. The paraffins crystallize when the temperature drops. This crystallization can lead to an increase in the viscosity of the crude, rendering its flow difficult, or the formation of a deposit. In the first case, a lowering of the pour point (*pour point depressant or PPD*) is required, whereas in the case of deposit, the use of a dispersant is preferred. Both types of products comprise the REPA range.

## POUR POINT DEPRESSANTS

The pour point depressants commonly referred to as PPD are comb polymers, the branchings of which are of the same size and distribution as the paraffins to be treated. To be effective, the PPD must crystallize a few degrees before the heavier paraffins. This co-crystallization interrupts the growth of the network on one of its faces. The smaller the paraffin crystals, the more easily they remain suspended.

**For 25 years, our expertise has improved to serve our customers and offer optimized solutions.**



Pig after pipe scraping

## DISPERSANTS AND SOLVENTS OF PARAFFINS

In a pipe or tubing, if the thermodynamic flow solely promotes the crystallization of the heavier paraffins, they adhere to the wall, forming a solid fat deposit. The addition of a paraffin dispersant in the REPA range, through continuous injection and upstream of the target area in concentrations ranging between 100 and 500 ppm, can prevent the formation of such deposit. Furthermore, the REPA paraffin dispersants feature a filming function. The inner wall of the pipe remains protected for several days if the injection of REPA is stopped.

When a pipe is already damaged, injecting a batch of paraffin solvent in contact with the deposit for several hours promotes its dissolution.

## TESTS AND PERFORMANCE

REP laboratories have four methods to study each crude to address the issues related to paraffins in the most accurate manner.

## RHEOLOGY

The study of rheology of paraffinic crude measures the performance of PPD. At constant shear, adding a PPD can significantly reduce the viscosity of crude.

## ASTM D58-53

The ASTM D58-53 is a standardized method derived from the ASTM D97. It consists of a slow cooling of a treated sample until the crude freezes. The pour point is thus determined. This method has become a point of reference in the oil industry.

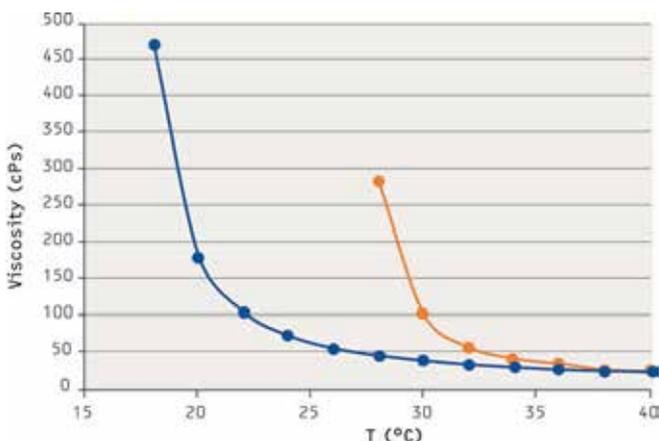


ASTM tubes according to the standard D58-53

### Argentine crude

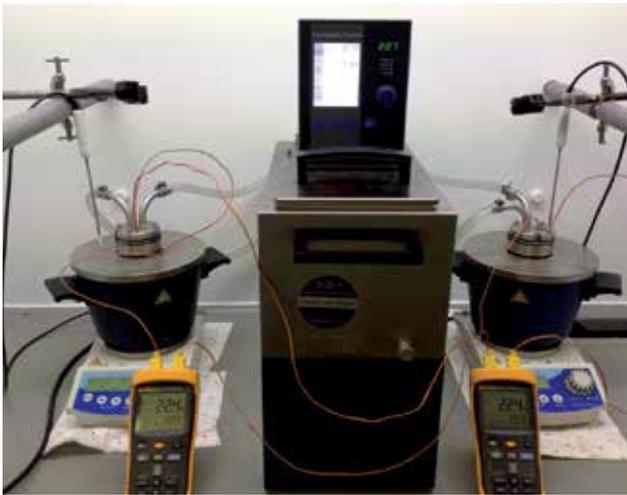
WAT = 42°C cooling rate = 0,5°C/min dosage PPD = 200ppm

- 200 ppm REPA 61V
- Paraffin Argentine crude (PP = 30°C)



## COLD FINGER

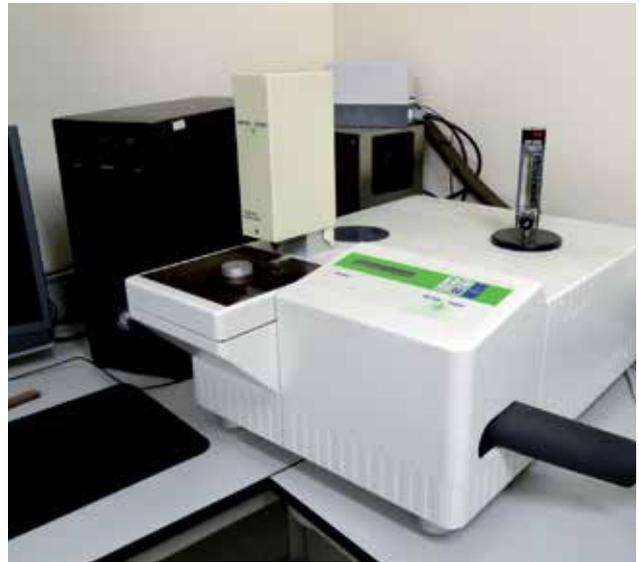
In the laboratory, a double cold finger reproduces the temperatures and the shear in a pipe during the deposition of paraffins, and controls the deposit mass obtained with and without dispersant. With the same apparatus, it is also possible to simulate the contact with a deposit already formed with a batch of paraffin solvent. The performance of the solvent is then validated by the loss of the deposit mass.



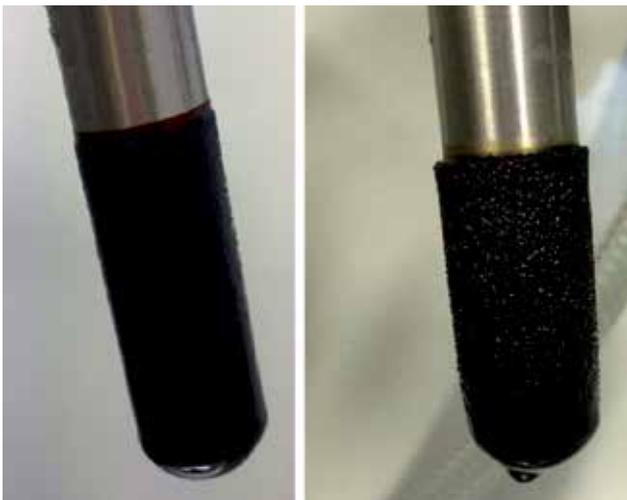
Cold finger apparatus

## CALORIMETRY

The use of *Differential Scanning Calorimetry* (DSC) determines the Incipient Crystallization Temperature (ICT), or the temperature of the appearance of the first crystals, and also to quickly assess the changes caused by the addition of a PPD on the crystallization of crude. Comparing the thermogram of a treated crude against that of a single crude allows the identification of variations in the crystallization profile during cooling.



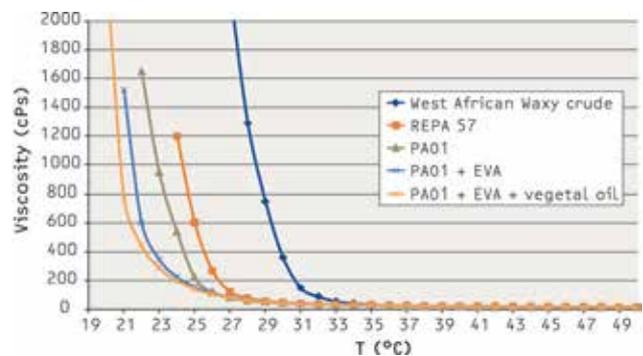
Mettler Toledo DSC 7 to pass 36 samples



Comparison of paraffin deposits

### Lowering pour point of West African crude with paraffins

PP = 30°C treatment rate = active 200ppm



## REPA RANGE : PRODUCTS AND FEATURES

Products	Composition	Action	Density at 20°C	Viscosity at 4°C (cPs)	Flash point (°C)	Application
REPA 501	Amine + ester	Dispersant	0.91	13	> 61	API gravity > 20°
REPA 505	Amine + ester + acid naphthalenesulfonic	Dispersant/ pipe protection	0.94	25	> 61	API gravity > 20°
REPA 510	Amine + ester + acid benzenesulfonique	Dispersant/ pipe protection	0.93	24	60	API gravity > 20°
REPA 520	Amine + ester + acid benzenesulfonic	Dispersant/ pipe protection	0.92	14	61	All types of crude/ paraffin deposits High concentration
REPA 61V	Polymethyl + plant oils	PPD	0.90	270	> 61	API gravity near 30°. High boiling point
REPA 85	CAnhydride-styrene copolymer maleic + polyacrylate	PPD	0.91	160	45	API gravity > 12°. Reduction of flow point of 20°C
REPA 90	Anhydride-styrene copolymer maleic + EVA	PPD	0.92	250	49	API gravity > 16°. Reduction of flow point of 15°C
REPA 33	Mixture of solvents aromatic and aliphatic	Solvent of paraffins	0.93	1	NA	All types of crude/ paraffin deposits
REPA 330	Plant methyl ester + ether of glycol + surfactant	Solvent of paraffins	0.88	8	30°C	All types of crude/ paraffin deposits
REPA 331	Plant methyl ester + ether of glycol + vegetable oil alkoxylated	Solvent of paraffins	0.89	8	62°C	All types of crude/ paraffin deposits
REPA 622V	Polymethyl + imidazoline + benzenesulfonic acid	PPD/Visco Breaker	0.92		67°C	Effective against both paraffin deposits and of asphaltene

**Environment**

In the field of oil production, REP products, developed in strict compliance with European standards, provide maximum safety, hygiene and prevention.

**Packaging**

REP products intended for use on site are available in a wide range of containers, notably including 215-liter drums and IBC totes of 1000 liters.

For further information about the REPA Range  
or to receive a sample, please contact us on  
+33 (0) 1 30 98 80 00 or at [info@rep.fr](mailto:info@rep.fr).



REP is available worldwide through its subsidiaries and distributors.  
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**REP: SUSTAINABLE SOLUTIONS IN  
THE SERVICE OF MANKIND, PRODUCTION  
AND THE ENVIRONMENT.**

Design and production: La machine à écrire  
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