

Attention of : Mr. J. Martinez

Analysis Report

Report number : **15300/00011184.7/L/22** Submitted date : 2022-10-31
 Main Object : Odin Petroil / Análisis Laboratorio Sample submitted at : Saybolt Colombia - Cartagena
 Report Date : 2022-10-31 Date received : 2022-10-31
 Date of issue : 2022-10-31 Date completed : 2022-10-31
 Sample object : Muestra 31-10-2022 Sample number : 13903616
 Sample type : Submitted
 Sample submitted as : Petroil 500 Marine MGO FO #4-ISO 8217-2017-F-DMA
 Marked : Petroil 500 Marine MGO FO #4-ISO 8217-2017-F-DMA

NAME	METHOD	UNIT	RESULT
API Gravity at 60 °F	ASTM D 1298-12b (2017)	°API	38.5
Density at 15 °C	ASTM D 1298-12b (2017)	kg/m ³	831.9
Total Sulfur Content	ASTM D 4294-21	% m/m	<0.012
Corrosion Copper Strip (3 h / 50 °C)	ASTM D 130-19	-	1a
ASTM Color	ASTM D 1500-17	-	L0.5
Kinematic Viscosity at 40 °C	ASTM D 445-21e1	mm ² /s	1.849
Water and sediment	ASTM D 1796-11(2016)	% v/v	0.0
Pour Point	ASTM D 97-17b	°C	<-33
Flash Point (PM) - Procedure A	ASTM D 93-20	°C	63.0
FAME content §	EN 14078:2014	% v/v	0.35
Micro Carbon Residue (10% bot.)	ASTM D 4530 / D 86-15 (20)	%m/m	<0.1
Ash Content	ASTM D 482-19	% m/m	<0.010
Distillation	ASTM D 86-20a		
Initial Boiling Point (IBP)		°C	182.0
5% Recovered		°C	191.0
10% Recovered		°C	194.5
20% Recovered		°C	203.5
30% Recovered		°C	210.0
40% Recovered		°C	218.0
50% Recovered		°C	226.5
60% Recovered		°C	234.5
70% Recovered		°C	245.5
80% Recovered		°C	260.0
90% Recovered		°C	276.5
95% Recovered		°C	292.0
Final Boiling Point (FBP)		°C	310.0
Recovery		vol %	98.5
Residue		vol %	1.0
Loss		vol %	0.5
Cetane Number §	ASTM D 613	-	44.30
Total aromatics §	ASTM D 6591-19	%v/v	19.8

All results in this report refer to the sample(s) tested as taken or submitted like specified in this Analysis report. Uncertainties, available on request, apply in the evaluation of the test results. All tests are conducted according to the latest version of the methods, unless another version is specifically indicated. Where available and for convenience purposes, the tested sample has been checked for compliance with supplied specifications, without accepting any liability for the supplied information. In case of dispute or concern, we refer to the interpretation of test results as defined in ASTM D3244, IP 367, ISO 4259 or GOST 33701. This report shall not be partially copied and reproduced without the written permission of the laboratory.

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NAME	METHOD	UNIT	RESULT
Stability Test (Reflectance) 90 min §	ASTM D 6468	%	98
Oxidation Stability §	ASTM D 2274-14(2019)		
Oxidation Stability		g/m ³	3.1
Lubricity by HFRR §	ASTM D 6079-18		
Lubricity by HFRR		µm	469.0

Tests marked with a § are witnessed by Saybolt only.

Saybolt's responsibility is limited to guarantee that:

- the sample tested is the sample as described in this certificate at the date indicated.
- the results reported are the ones actually determined by the laboratory personnel.

The signature of the Saybolt inspector/chemist on site on the laboratory analysis report/certificate issued by the supplier, (or on this form issued by Saybolt as part of the inspection report), by no means is to be considered a guarantee of the correctness of the testing equipment, which remains the sole responsibility of the performing laboratory, but only confirms that the analytical methods used are the ones indicated.

Signed by: Ronald Vargas Barrios - Laboratory Supervisor I
Issued by: Saybolt de Colombia SAS
Place and date of issue: Cartagena - 2022-10-31