

## Laboratory Test Report

Product: MARINE DIESEL  
Creation date: 15/07/2023 01:16  
Results Issuance Date: 15/07/2023 02:28  
Customer: Raw Materials and Products

Sample ID: 2307150053

NATIONAL CHECK  
Certificate No.: 2000074755



Tank: 3042						
Analysis	Unit	Norm	Results	Maximun	Minimun	
WATER	mL	*ASTM D2709-22	0.00			
SEDIMENTS	mL	*ASTM D2709-22	0.00			
EMULTION	mL	*ASTM D2709-22	0.00			
WATER AND SEDIMENTS	%VOL	*ASTM D2709-22	0.00	<=0.2		
PARTICLES	ADM	ASTM D4176-21a	PASS		In(PASS)	
FREE WATER	ADM	ASTM D4176-21a	PASS		In(PASS)	
APPEARANCE (HAZE)	ADM	ASTM D4176-21a	PASS		In(PASS)	
APPEARANCE	ADM	VISUAL	CLEAR, BRIGHT AND VISUALLY FREE OF SOLIDS AND NON- DISSOLVED WATER		In(CLEAR, BRIGHT AND VISUALLY FREE OF SOLIDS AND NON- DISSOLVED WATER)	
TOTAL SULPHUR	%	*ASTM D5453-19a	0.0007	<=0.5		
TOTAL SULPHUR (mg/kg)	mg/kg	*ASTM D5453-19a	7.0			
ASHES	%	*ASTM D482-19	0.0003	<=0.01		
ASHES (g/100g)	g/100g	*ASTM D482-19	0.0003			
COPPER CORROSION, 3H TO 50°C	ADM	*ASTM D130-19	1a		In(1a;1b;2a;2b;2c;2d)	
DENSITY AT 15°C	kg/m3		863.9	<=890	>=500	
PIE	°C	*ASTM D86-20b	163.2			
05%	°C	*ASTM D86-20b	198.7			
10%	°C	*ASTM D86-20b	217.8			
20%	°C	*ASTM D86-20b	247.1			
30%	°C	*ASTM D86-20b	268.7			
40%	°C	*ASTM D86-20b	285.2			
50%	°C	*ASTM D86-20b	299.0			
60%	°C	*ASTM D86-20b	311.3			
70%	°C	*ASTM D86-20b	323.0			

## Laboratory Test Report

Product: MARINE DIESEL  
Creation date: 15/07/2023 01:16  
Results Issuance Date: 15/07/2023 02:28  
Customer: Raw Materials and Products

Sample ID: 2307150053

NATIONAL CHECK  
Certificate No.: 2000074755



Tank: 3042						
Analysis	Unit	Norm	Results	Maximun	Minimun	
80%	°C	*ASTM D86-20b	335.5			
90%	°C	*ASTM D8620b	351.2			
95%	°C	*ASTM D86-20b	364.6			
PFE	°C	*ASTM D86-20b	365.9			
REC TOTAL	%VOL	*ASTM D86-20b	99.4			
LOSSES	%VOL	*ASTM D86-20b	0.6			
RESIDUE	mL	*ASTM D86-20b	1.5			
BAROMETRIC PRESSURE	kPa	*ASTM D86-20b	100.9			
API GRAVITY	API	*ASTM D1298-12b(2017)	32.2			
H2S	mg/kg	IP 570	0	<=2		
DENSITY AT 15°C	g/mL	*ASTM D4737-12b(2017)	0.8639			
		*ASTM D4737-21(Proced. A)	46.1			>=40
LUBRICITY	µm	ASTM D6079-18	400.5	<=520		
METIL ESTER B-2	%VOL	EN 14078-14	0			
ACID NUMBER	mg KOH/g		0.061	<=0.5		
PAD RATING	% Reflectance	ASTM D6468-08(2019)	98			
		ASTM D6468-08(2019)	150			
TEST TEMPERATURE ANALYSIS TIME	Min	ASTM D6468-08(2019)	90			
FLASHPOINT	°C	*ASTM D56-22 LT	63.0			>=60
POUR POINT	°C	*ASTM D5950-14(2020) Model CPP-5Gs (3 °C)	-6.0	<=4		
REC 340°C	%VOL	ASTM D86-20b	83.3			>=50
RESIDUAL COAL	%	*ASTM D4530-15(2020)	0.01	<=0.2		
		*ASTM D4530-15(2020)	0.01			
RESIDUAL COAL (g/100g)	g/100g					

## Laboratory Test Report

Product: MARINE DIESEL  
 Creation date: 15/07/2023 01:16  
 Results Issuance Date: 15/07/2023 02:28  
 Customer: Raw Materials and Products

Sample ID: 2307150053



NATIONAL CHECK  
 Certificate No.: 2000074755

Tank: 3042					
Analysis	Unit	Norm	Results	Maximun	Minimun
KINEMATIC VISCOSITY AT 40°C	cSt	*ASTM D445-21	4.270	<=6	>=1.5
KINEMATIC VISCOSITY AT 40°C (mm2/s)	mm2/s	*ASTM D445-21	4.270		

**Observations:**

The laboratory is not responsible for sampling, the results are applied to the sample as received.  
 \* Accredited standard ONAC-Code OEC 18-LAB-036. The results are only related to the items tested.  
 Sample customer intake according to ASTM D4057. Product complies with Resolution 80195 of 1999. DMA type product under ISO 8217-2017.  
 Declaration of Conformity: Results are in accordance with specifications.  
 Decision rule: IEC guide 115 is applied. In case of differences in measurements, possible causes must be identified and if they persist the differences will apply the criteria established in the ASTM D3244 standard.

Quality Approval:



Jorge Iván Córdoba Bermúdez  
 Head of the Quality Inspection Department – PIQ

Quality Approval:



Liliana Patricia Angulo Jimenez  
 Head of the Raw Materials and Products Department - PMU

Cartagena Refinery, Quality Inspection Department, Telephones (095) 6682480 - 6682237 Cartagena - Colombia,  
 All rights reserved for Ecopetrol S.A. No external reproduction, copy or digital transmission of this publication may be made without written permission. No paragraph of this publication may be reproduced, copied or transmitted digitally without the written approval of the laboratory and / or in accordance with the laws that regulate copyright and based on current regulations.

End of Report