

RE: 320/2020

Date of Issue: **Aug, 17th2020**

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Applicant/Contact: Logitech Assessoria em Logística Ltda / Wilson José Romão and Venâncio Alvarenga Gomes

Address: das Américas, 2480, bl 02, sl 314, Barra da Tijuca, Rio de Janeiro, RJ.

Sample: DIESEL TYPE B - S500

Entry Lab Date: Apr.15th. 2020

Client Identif.: Sample with Green Plus additive.

Date of Collection/Samp: Apr. 15th. 2020

NOTE: -

Date of service: Apr. 13th. 2020

| Assay | Unit | Method | Result | Date of test | Specification, where applicable <i>Inform which was used:</i> RANP #50 2013 | Uncertainty (U) or Limit of Indeterminacy (LI), if applicable <i>Inform which was used:</i> LI*** (F-221) |
|---------------------------------|--------------------|------------------------------|--------------------------------|-------------------------------|--|--|
| Aspect | - | ASTM D 4176-04(2014) | Clear and free from impurities | April 29 th . 2020 | Clear and free from impurities | - |
| Color | - | Visual - IT-LEC-00-11 rev.14 | Red | April 29 th . 2020 | Red | - |
| Biodiesel content | % v/v | EN 14078-2014 | 13,0 | May 04 th . 2020 | 10,5 a 15,5 | 10,0 a 16,2 |
| Sulphur content | mg/kg | ASTM D 4294-16e1 | 290 | April 23 rd . 2020 | 0 a 500 | ± 62 |
| Specific Mass at 15°C | kg/m ³ | ASTM D 4052-18a | 860,1 | April 17 th . 2020 | - | - |
| Specific Mass at 20°C | kg/m ³ | ASTM D 4052-18a | 856,5 | April 17 th . 2020 | 815,0 a 865,0 | ±0.3 kg/m3 |
| Flash Point | °C | ASTM D 93-19 | 42,1 | April 16 th . 2020 | > 38 | ±1,6 |
| Viscosity | mm ² /s | ASTM D 445-19 | 3,232 | April 24 ^h . 2020 | 2,0 a 4,5 | 1,974 a 4,559 |
| Cold Filter Plugging Point | °C | ASTM D 6371-17a | 1,0 | April 22 nd . 2020 | Max. 7 (month of April in MG) | ±1 |
| Micro residue of Carbon | % m/m | ASTM D4530-15 | 0,01 | April 27 th . 2020 | - | - |
| Ramsbottom Carbon Residue | % m/m | ASTM D 524-15 | 0,06 | May 05 th . 2020 | Max. 0.25 | ± 0,04 |
| Ash | % m/m | ASTM D 482-13 | 0,0017 | April 30 th . 2020 | Max. 0.010 | ±0,005 |
| Copper Corrosivity at 50°C, 3hs | - | ASTM D 130-19 | 1b | April 24 th . 2020 | Max. 1 | - |
| Water content | mg/kg | ASTM D 6304-16e1 | 176 | April 16 th . 2020 | Max. 200 | ±415 |
| Water and Sediments | % v/v | ASTM D 2709-16 | < 0,01 | April 27 th . 2020 | Max. 0.05 | ±0,001 |
| Acidity Index | mgKOH/g | ASTM D 664-18e2 | 0,06 | April 16 th . 2020 | - | - |
| Lubricity | µm | ASTM D 6079-18 | 166 | April 28 th . 2020 | Max. 520 | ±47 |
| Higher calorificvalue | MJ/kg | ASTM D240-17 | 44,449 | April 28 th . 2020 | - | - |
| Lower Calorific Value | MJ/Kg | ASTM D240-17 | 41,763 | Aug 17 th . 2020 | - | - |

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Address: Av. das Américas, 2480, bl 02, sl 314, Barra da Tijuca, Rio de Janeiro, RJ.

Sample: DIESEL TYPE B - S500 **Entry Lab Date:** Apr 15th 2020

Client Identif.: Sample with Green Plus additive. **Collection Date/Samp:** Apr 15th 2020

NOTE: - **Date of service:** Apr 13th 2020

| | | | | | | |
|-----------------------|-------|---------------------------------|---------|-----------------------------|------------|------|
| Carbon* | % m/m | Elementary Analysis | 81,48 | July 31 st 2020 | - | - |
| Hydrogen* | % m/m | Elementary Analysis | 12,66 | July 31 st 2020 | - | - |
| Nitrogen* | % m/m | Elementary Analysis | <0,0017 | July 31 st 2020 | - | - |
| T 10% of distillation | °C | ASTM D 86-18 | 175,0 | April 22 nd 2020 | NOTE DOWN | - |
| T 50% of distillation | °C | ASTM D 86-18 | 299,7 | April 22 nd 2020 | 245 to 310 | ±1,8 |
| T 85% of distillation | °C | ASTM D 86-18 | 350,4 | April 22 nd 2020 | Max. 360 | - |
| T 90% of distillation | °C | ASTM D 86-18 | 360,3 | April 22 nd 2020 | NOTE DOWN | - |
| T 95% of distillation | °C | ASTM D 86-18 | 378,3 | April 22 nd 2020 | - | - |
| Final Boiling Point | °C | ASTM D 86-18 | 393,1 | April 22 nd 2020 | - | ±4,2 |
| Distillation residue | mL | ASTM D 86-18 | 1,0 | April 22 nd 2020 | - | - |
| Oxidation Stability | h | EN 15751-2014 | 32,10 | April 23 rd 2020 | - | - |
| Cetane Index | - | ASTM D4737-10(2016) Method A | 45,0 | April 24 th 2020 | - | - |

Sampling or collection plan:

The Diesel S500 fuel was collected by LEC UFMG (Fuel testing laboratory Federal University of Minas Gerais) in a previously cleaned drum. At the time of collection the drum was washed with the fuel itself, this portion was discarded and later a new aliquot was sampled.

Procedural deviations:

NA

NOTE:

* Subcontracted testing.

Preparation:

The **GREEN PLUS** fuel + additive mixture was prepared in the concentration requested by the customer of 30 mL to 100 L (300 microliters to 1 liter), using the following material:

- Class A volumetric flask, BVL 214, nominal capacity 1000 mL, calibrated by a laboratory belonging to RBC (Engecal) (Brazilian Labs Calibration Network) Certified by INMETRO, CER58906/18, calibration validity 08/2028.
- Micropipette, adjustable volume, MCP 585, nominal capacity 0.1 to 1 mL, calibrated by a laboratory belonging to the RBC (Engecal), CER18795/19, calibration validity 05/2021.

The results presented in this report refer exclusively to the sample cited.

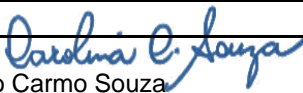
Report: **Sample complies with ANP (National Petroleum Agency) specifications for the characteristics evaluated.**

Decision rule of the report : ANP Resolution 50/2013 and ***ANP Indeterminacy Limits (0.59 x Repro norms - ISO4259).

Interpretation:

NA

NA or - : Not Applicable.


Carolina do Carmo Souza

- Responsible Chemist for Regular Tests

Nº CRQ (Chemistry Regional Council Number) : 02101288