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Brazil Revises Gasoline Specifications with Transition Period for Compliance until August 3, 2020

Stratas Advisors

The National Agency of Petroleum, Natural Gas and Biofuels (ANP) in Brazil issued Resolução ANP No. 807 on Jan. 23, 2020, whereby the agency revised the specifications for gasoline sold throughout the country. The resolution came into force on Feb. 3, 2020 and establishes the requirements to be met by fuel distributors and aims to improve the quality of Brazilian automotive gasoline. With the release of the new gasoline specification, the previous requirements under Resolução ANP No. 40 from Oct. 25, 2013 have been revoked. The initiative to revise the gasoline specification stems from the ANP reviewing research on quality standards, consideration of international specifications and input from industry stakeholders in the fuel market.

The resolution contains specifications for two gasoline grades, Gasoline A and Gasoline C. The modification of the gasoline specification focused on the following three parameters:

- Specific gravity;
- T50 distillation; and
- Replacement of AKI with RON for regular and premium grades of Gasoline C.

Limits for the other parameters including sulfur remain the same. Although the main changes to the gasoline specifications focused on the above modifications, Resolução ANP No. 807 also revised the classification listed for automotive gasolines utilized in the standard.

Beginning with specific gravity, Gasoline C will now have a minimum limit of 715.0 kg/m3; whereas under the previous specification, this parameter was to be reported. As for Gasoline A, the limits for specific gravity will take into consideration the volume of ethanol being enforced at that time (see table below).

Specific Gravity for Gasoline A

Current Ethanol Content (vol%)	Specific Gravity for Gasoline A (kg/m3), minimum
27	688.9
26	690.2

25	691.5
24	692.8
23	694.0
22	695.2
21	696.4
20	697.6
19	698.7
18	699.8

Source: National Agency of Petroleum, Natural Gas and Biofuels, Resolução ANP No. 807, Jan. 23, 2020

The next modification in Resolução ANP No. 807 addressed the T50 distillation temperature for Gasoline A; whereby the ANP considered its impact on engine performance and driveability. Prior to the revision, Resolução ANP No. 40 set the T50 maximum limit at 120.0°C for Gasoline A. Within Resolução ANP No. 807, the specification now includes a minimum limit for T50 set at 77.0°C while the maximum limit remains at 120.0°C.

In the previous gasoline specification under Resolução ANP No. 40, only the MON and the AKI limits were specified in the standard. In the new resolution, the ANP replaced the AKI with RON limits for the regular and premium grades of Gasoline C within the gasoline specifications. In the revised specification, RON 93 and RON 97 apply to the regular and premium grades of Gasoline C respectively. Additionally, the MON parameter will now have to be reported for the premium grade of Gasoline C in the new specifications.

Furthermore, Resolução ANP No. 807 added terminology to the four classifications of Gasoline A and C for the regular and premium grades. The four classifications of Gasoline A and C are as follows:

- Regular grade of Gasoline A: fuel produced from processes used in refineries, petrochemical raw material plants and formulators, intended for automotive vehicles equipped with spark ignition engines, free from oxygenated components;
- Premium grade of Gasoline A: high octane fuel, produced from processes used in refineries, petrochemical raw material plants and formulators, for automotive vehicles equipped with spark ignition engines whose design requires a higher octane gasoline, free of oxygenated components;
- Regular grade of Gasoline C: fuel obtained from the mixture of regular grade of Gasoline A and anhydrous ethanol fuel, in the proportions defined by the legislation in force; and
- Premium grade of Gasoline C: fuel obtained from the mixture of premium grade of Gasoline A and anhydrous ethanol fuel, in the proportions defined by the legislation in force.

As the transition to the new requirements takes place as the year progresses, Article 16 in the new gasoline specification will maintain the obligations under Resolução ANP No. 40 for specific gravity, T50 distillation temperature and AKI, which will remain in effect until August 2, 2020 (see table below).

Transition Specifications for Regular and Premium Grades of Gasoline A and C until August 2, 2020

Parameter	Unit	Limit				Test Method	
		Regular Grade		Premium Grade			
		Gasoline A	Gasoline C	Gasoline A	Gasoline C	ABNT NBR	ASTM
Specific gravity at 20°C	kg/m^3	Report				7148 14065	D1298 D4052
Distillation 50% evaporated, max.	°C	120.0	80.0	120.0	80.0	D86 D7345	9619
AKI, min.	-	-	87.0	-	91.0	-	D2699 D2700

Source: National Agency of Petroleum, Natural Gas and Biofuels, Resolução ANP No. 807, Jan. 23, 2020

Lastly, under Article 17 of Resolução ANP No. 807, the ANP will also allow for a transition period for compliance for the revised limits to specific gravity, T50 distillation temperature and AKI. The periods where the ANP will issue notices of non-compliance will occur after the indicated time frame, those periods being:

- For gasoline in distribution: 60 days from August 3, 2020; and
- For gasoline at resale: 90 days from August 3, 2020.

Current Gasoline Specifications

	2020	2020	2020	2020	2020	2020	2020	2020
Spec Name	Resolução ANP N° 40, 2013	Resolução ANP N° 40, 2013	Resolução ANP N° 40, 2013	Resolução ANP N° 40, 2013	Resolução ANP N° 807, 2020	Resolução ANP N° 807, 2020	Resolução ANP N° 807, 2020	Resolução ANP N° 807, 2020
Grade	Gasolina A-Premium	Gasolina A-Regular	Gasolina C-Premium	Gasolina C-Regular	Gasolina A-Premium	Gasolina A-Regular	Gasolina C-Premium	Gasolina C-Regular
Grade Category	Blendstock	Blendstock	On-road	On-road	Blendstock	Blendstock	On-road	On-road
Effective Date	Jan, 2014	Jan, 2014	Jan, 2014	Jan, 2014	Feb, 2020	Feb, 2020	Feb, 2020	Feb, 2020
Source	ANP	ANP	ANP	ANP	ANP	ANP	ANP	ANP
Additional Comments	Pre-Ethanol Blending	Pre-Ethanol Blending			Pre-Ethanol Blending	Pre-Ethanol Blending		

	2020	2020	2020	2020	2020	2020	2020	2020
Properties								
RON	(1)	(1)			(1)	(1)		
RON, min							97 (2) (1)	92.0 (3) (1)
MON	(1)	(1)			(1)	(1)		
MON, min				82			Report (1)	82 (1)
Antiknock index (MON+RON)/2, calculated, min				91	87		91	87
Sulfur, ppm, max			50	50			50	50
Lead, g/l, max	0.005 (4)	0.005 (4)	0.005 (4)	0.005 (4)	0.005 (4)	0.005 (4)	0.005 (4)	0.005 (4)
Benzene, vol%, max			1.0 (5)	1.0 (5)			1.0 (5)	1.0 (5)
Aromatics, vol%, max			35 (6)	35 (6)			35 (6)	35 (6)
Olefins, vol%, max			25 (6)	25 (6)			25 (6)	25 (6)
RVP @ 37.8°C (100°F), kPa, min	45 (7)	45 (7)			45 (7)	45 (7)		
RVP @ 37.8°C (100°F), kPa, max	62 (7)	62 (7)	69 (7)	69 (7)	62 (7)	62 (7)	69 (7)	69 (7)
Density @ 20°C, kg/m3, min		Report	Report	Report			715.0 (2)	715.0 (2)
Density @ 20°C, kg/m3, max		Report	Report	Report				
Density @ 20°C, kg/m3					(8)	(9)		
Distillation								
T10, °C, max	65	65	65	65	65	65	65	65
T50, °C, min					77.0 (10)	77.0 (10)		
T50, °C, max	120	120	80	80	120.0 (10)	120.0 (10)	80	80
T90, °C, max	190	190	190	190	190	190	190	190
FBP, °C, max	215	215	215	215.0	215	215	215	215.0
Residue, vol%, max	2	2	2	2.0	2	2	2	2.0
Oxygenates								
Methanol, vol%, max	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol, vol%, max	1 (11)	1 (11)	25 (12)	27 (12)	1 (11)	1 (11)	25 (12)	27 (12)
Silicon, ppm, max	Report	Report	Report	Report	Report	Report	Report	Report
Phosphorus, g/l, max	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

	2020	2020	2020	2020	2020	2020	2020	2020
Oxidation stability (Induction period), minutes, min			360	360			360	360
Existent gum (solvent washed), mg/100ml, max	5	5	5	5	5	5	5	5
Corrosion								
Copper corrosion, 3hr @ 50°C, merit (class)	1	1	1	1	1	1	1	1
Color	colorless or yellowish, free of dyes	colorless or yellowish, free of dyes	colorless or yellowish (13)	colorless or yellowish (13)	colorless or yellowish, free of dyes	colorless or yellowish, free of dyes	colorless or yellowish (13)	colorless or yellowish (13)
Appearance	Clear, free of impurities	Clear, free of impurities	Clear, free of impurities	Clear, free of impurities	Clear, free of impurities	Clear, free of impurities	Clear, free of impurities	Clear, free of impurities
Intake-valve cleanliness II, method 1,2,3, mg/valve	(14) (15)	(14) (15)	100 (14) (15) (16)	100 (14) (15) (16)	(14) (15)	(14) (15)	100 (14) (15) (16)	100 (14) (15) (16)
Combustion chamber deposits, method 1, % base fuel			140 (17)	140 (17)			140 (17)	140 (17)
Use of additives	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)

(1) The party submitting the gasoline for testing (refiner, fuel blender, importer, etc) must report MON and RON index of a mixture between Gasoline A and anhydrous ethanol blended one percent less than the currently mandated by legislation.

(2) Effective as of August 3, 2020. Until August 2, 2020, parameters under Resolucao 40/2013 remain in effect.

(3) Until December 31, 2021, the limit is set at 92.0. From January 1, 2022, the limit of 93.0 will come into effect.

(4) Addition of lead to Gasoline A or C is prohibited: test is to be performed when there is suspicion of contamination.

(5) Referee Test Method: ASTM D3606

(6) Gas chromatography may also be used to determine level aromatics and olefins.

(7) For the states of Rio Grande do Sul, Santa Catarina, Parana, Sao Paulo, Rio de Janeiro, Espirito Santo, Minas Gerais, Mato Grosso, Mato Grosso do Sul, Goias, Tocantins and Distrito Federal, from April to November, the maximum allowable vapor pressure increases by 7 kPa.

(8) The values to be observed for the specific gravity in gasoline A should consider the ethanol content in force.

(9) The values to be observed for the specific gravity in gasoline A should consider the ethanol content in force.

(10) Effective as of August 3, 2020. Until August 2, 2020, parameters under Resolucao 40/2013 remain in effect i.e. max

120.0°C.

(11) Addition of ethanol to Gasoline A is prohibited: test is to be performed when there is suspicion of contamination by ethanol.

(12) The ethanol to be added to Gasoline C must be anhydrous, and must conform to the specifications mandated by current law. Maximum ethanol content is determined by the Ministry of Agriculture.

(13) Dyes can be used up to a concentration of 50ppm as long as they are not blue in color (used in aviation gasoline).

(14) Gasoline producers, importers and distributors shall inform about the name and registration number of the ANP detergent dispersant used in the Certificates of Quality and Compliance Bulletin.

(15) It is not necessary to perform this test for the issuance of the Certificate of Quality, which does not relieve fuel distributors from the responsibility to meet the limit in the specification along the entire supply chain.

(16) This value shall be calculated as the arithmetic average of the deposits found in the four intake valves of the engine in a test performed with a reference fuel specified by the ANP. It should be treated with the use of detergent dispersant concentration which should be in conformity to its registration with ANP.

(17) The deposits in the combustion chamber should be compared to deposits formed when the same test is performed with the fuel free of detergent dispersants.

(18) Use of additives is limited to those additives sanctioned by the laws currently in force. Use of additive based on heavy metals is prohibited.

Stratas Advisors' View

With modifications made to the specification, Brazil has taken the steps to improve the quality of gasoline distributed within the country in the coming year. The ANP addressed the lack of a minimum limit for specific gravity within the specification, wherein the agency replaced the previous "Report" value with a new limit set to be fully enforced by the end of 2020. Furthermore, the ANP added a minimum limit for the T50 distillation temperature which had not been stated in the prior 2013 specification. Lastly, with the addition of RON limits for the regular and premium grades of Gasoline C, fuel distributors operating in the country will have the clarification needed to produce and distribute gasoline meeting the requirements in Resolução ANP No. 807.

Moreover, with the Liquid Fuel Quality Monitoring Program the ANP has in place, the properties in the gasoline distributed in the country could easily be verified against the specification. In addition, even though the parameters the ANP chose to

modify in the new specification would not enter into force until August 2, 2020, the agency also built in supplemental deadlines that would allow fuel distributors two to three months of time to fully comply with the requirements in the specification. In conclusion, Stratas Advisors will monitor the transition over the coming year as the country moves towards full compliance with Resolução ANP No. 807.

  1616 South Voss Road Suite 675 | Houston, TX 77057 | United States | +1.713.260.6426 | stratasadvisors.com