

AFTON CHEMICAL CORPORATION
P.O. BOX 2158
23219, RICHMOND
United States



Attention of : Mr. R. Szwabowski
Your reference : PO #4556411-2

Analysis Report

Report number : 13072/00009328.4/L/20 Submitted date : 06-16-2020
Sample submitted at : Saybolt LP, Deer Park
Report Date : 07-02-2020 Date received : 06-17-2020
Date of issue : 07-02-2020 Date completed : 07-02-2020
Sample object : Afton Chemical-Richmond Sample number : 10060223
Sample type : Submitted
Sample submitted as : Gasoline
Marked : R20005261L01

NAME	METHOD	UNIT	RESULT
Gravity API at 60 °F	ASTM D 4052	°API	59.6
Density @15C	ASTM D 4052	-	0.7401
Heat of Combustion	ASTM D 240		
Gross Heat of Combustion		Btu/lb	19741
Net Heat of Combustion		Btu/lb	18523
Carbon/Hydrogen Content	ASTM D 5291		
Carbon		mass %	86.65
Hydrogen		mass %	13.35
Distillation	ASTM D 86		
Initial boiling point		°F	84.1
5% Evaporated		°F	109.2
10% Evaporated		°F	121.7
20% Evaporated		°F	139.8
30% Evaporated		°F	160.7
40% Evaporated		°F	188.4
50% Evaporated		°F	215.4
60% Evaporated		°F	230.3
70% Evaporated		°F	241.7
80% Evaporated		°F	260.1
90% Evaporated		°F	314.8
95% Evaporated		°F	338.8
Final boiling point		°F	386.7
Recovery		vol %	98.1
Residue		vol %	1.0
Loss		vol %	0.9
Evaporated at 200 °F		vol %	43.8
Evaporated at 300 °F		vol %	87.9
Existent Gum	ASTM D 381		
Before Wash		mg/100mL	11.5
After Wash		mg/100mL	<0.5
Hydrocarbon Type FIA	ASTM D 1319		

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NAME	METHOD	UNIT	RESULT
Aromatics		vol %	30.7
Olefins		vol %	0.6
Saturates		vol %	68.7
Oxidation Stability	ASTM D 525	min	960+
Research Octane Number (RON)	ASTM D 2699	-	96.6
Motor Octane Number (MON)	ASTM D 2700	-	88.5
(RON+MON)/2	Calculated	-	92.6
Oxygenates	ASTM D 5599		
Methanol		LV %	<0.1
Ethanol		LV %	<0.1
iso-Propanol		LV %	<0.1
tert-Butanol		LV %	<0.1
n-Propanol		LV %	<0.1
MTBE		LV %	<0.1
sec-Butanol		LV %	<0.1
DIPE		LV %	<0.1
iso-Butanol		LV %	<0.1
ETBE		LV %	<0.1
ter-Amyl Alcohol		LV %	<0.1
n-Butanol		LV %	<0.1
TAME		LV %	<0.1
Total oxygen		mass %	<0.02
Sulphur (S)	ASTM D 5453	mg/kg	2.4
Vapor Pressure 100F, EPA Eq.	ASTM D 5191	psi	8.97
Copper corrosion	ASTM D 130		
Copper Strip Corrosion (3 hrs / 50 °C)		-	1A
Water and Sediment	ASTM D 2709	vol %	<0.01
Aromatic Content	ASTM D 5769		
Benzene		vol %	0.04
Toluene		vol %	19.20
Ethyl Benzene		vol %	0.06
meta-Xylene		vol %	0.42

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Sample submitted as : Gasoline
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NAME	METHOD	UNIT	RESULT
para-Xylene		vol %	0.15
ortho-Xylene		vol %	0.74
Isopropyl Benzene		vol %	0.10
n-Propyl Benzene		vol %	0.50
meta-Ethyltoluene		vol %	1.71
para-Ethyltoluene		vol %	0.81
1,3,5 Trimethylbenzene		vol %	0.85
ortho-Ethyltoluene		vol %	0.75
1,2,4 Trimethylbenzene		vol %	3.04
1,2,3 Trimethylbenzene		vol %	0.93
Indane		vol %	0.14
4-methyl Indane		vol %	<0.01
5-methyl Indane		vol %	<0.01
Naphthalene		vol %	0.01
2-methyl Naphthalene		vol %	0.12
1-methyl Naphthalene		vol %	0.08
C10 Aromatics		vol %	1.64
C11 Aromatics		vol %	0.01
Dimethyl Indanes		vol %	0.01
Total Aromatics		vol %	31.31
Olefin Content	ASTM D 6550	mass %	<1.0
Lead (Pb)	ASTM D 3237	g/US gal	< 0.1
Phosphorus (P)	ASTM D 3231	g/US gal	< 0.0008
Manganese (Mn)	ASTM D 3831	mg/L	< 0.25
Particulate content	ASTM D 5452		
Particulate content		mg/L	< 0.1
Total volume		mL	1000
Metals by ICP	ASTM D 5708		

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Sample type : Submitted Sample number : 10060223
Sample submitted as : Gasoline
Marked : R20005261L01

NAME	METHOD	UNIT	RESULT
Silicon (Si) - Method A		mg/kg	<0.20

Signed by: Sandra Kaluza - Laboratory Coordinator
Issued by: Saybolt LP
Place and date of issue: Deer Park - 07-02-2020

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Date of issue : 07-02-2020 Date completed : 07-02-2020
Sample object : Afton Chemical-Richmond Sample number : 10060224
Sample type : Submitted
Sample submitted as : Gasoline
Marked : R20006386

NAME	METHOD	UNIT	RESULT
Gravity API at 60 °F	ASTM D 4052	°API	59.6
Density @15C	ASTM D 4052	-	0.7404
Heat of Combustion	ASTM D 240		
Gross Heat of Combustion		Btu/lb	19740
Net Heat of Combustion		Btu/lb	18537
Carbon/Hydrogen Content	ASTM D 5291		
Carbon		mass %	86.81
Hydrogen		mass %	13.19
Distillation	ASTM D 86		
Initial boiling point		°F	86.2
5% Evaporated		°F	110.0
10% Evaporated		°F	122.2
20% Evaporated		°F	140.8
30% Evaporated		°F	161.6
40% Evaporated		°F	189.5
50% Evaporated		°F	215.4
60% Evaporated		°F	230.2
70% Evaporated		°F	241.0
80% Evaporated		°F	259.6
90% Evaporated		°F	311.8
95% Evaporated		°F	338.3
Final boiling point		°F	386.2
Recovery		vol %	97.9
Residue		vol %	1.1
Loss		vol %	1.0
Evaporated at 200 °F		vol %	43.5
Evaporated at 300 °F		vol %	87.8
Existent Gum	ASTM D 381		
Before Wash		mg/100mL	12.0
After Wash		mg/100mL	<0.5
Hydrocarbon Type FIA	ASTM D 1319		

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Sample type : Submitted
Sample submitted as : Gasoline
Marked : R20006386

NAME	METHOD	UNIT	RESULT
Aromatics		vol %	28.0
Olefins		vol %	0.7
Saturates		vol %	71.3
Oxidation Stability	ASTM D 525	min	960+
Research Octane Number (RON)	ASTM D 2699	-	96.6
Motor Octane Number (MON)	ASTM D 2700	-	88.5
(RON+MON)/2	Calculated	-	92.6
Oxygenates	ASTM D 5599		
Methanol		LV %	<0.1
Ethanol		LV %	<0.1
iso-Propanol		LV %	<0.1
tert-Butanol		LV %	<0.1
n-Propanol		LV %	<0.1
MTBE		LV %	<0.1
sec-Butanol		LV %	<0.1
DIPE		LV %	<0.1
iso-Butanol		LV %	<0.1
ETBE		LV %	<0.1
ter-Amyl Alcohol		LV %	<0.1
n-Butanol		LV %	<0.1
TAME		LV %	<0.1
Total oxygen		mass %	<0.02
Sulphur (S)	ASTM D 5453	mg/kg	2.3
Vapor Pressure 100F, EPA Eq.	ASTM D 5191	psi	8.96
Copper corrosion	ASTM D 130		
Copper Strip Corrosion (3 hrs / 50 °C)		-	1A
Water and Sediment	ASTM D 2709	vol %	<0.01
Aromatic Content	ASTM D 5769		
Benzene		vol %	0.04
Toluene		vol %	19.44
Ethyl Benzene		vol %	0.06
meta-Xylene		vol %	0.42

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NAME	METHOD	UNIT	RESULT
para-Xylene		vol %	0.15
ortho-Xylene		vol %	0.74
Isopropyl Benzene		vol %	0.11
n-Propyl Benzene		vol %	0.49
meta-Ethyltoluene		vol %	1.72
para-Ethyltoluene		vol %	0.81
1,3,5 Trimethylbenzene		vol %	0.86
ortho-Ethyltoluene		vol %	0.76
1,2,4 Trimethylbenzene		vol %	3.03
1,2,3 Trimethylbenzene		vol %	0.93
Indane		vol %	0.14
4-methyl Indane		vol %	<0.01
5-methyl Indane		vol %	<0.01
Naphthalene		vol %	0.01
2-methyl Naphthalene		vol %	0.12
1-methyl Naphthalene		vol %	0.08
C10 Aromatics		vol %	1.63
C11 Aromatics		vol %	0.01
Dimethyl Indanes		vol %	0.01
Total Aromatics		vol %	31.56
Olefin Content	ASTM D 6550	mass %	<1.0
Lead (Pb)	ASTM D 3237	g/US gal	< 0.01
Phosphorus (P)	ASTM D 3231	g/US gal	< 0.0008
Manganese (Mn)	ASTM D 3831	mg/L	< 0.25
Particulate content	ASTM D 5452		
Particulate content		mg/L	0.2
Total volume		mL	1000
Metals by ICP	ASTM D 5708		

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Marked : R20006386

NAME	METHOD	UNIT	RESULT
Silicon (Si) - Method A		mg/kg	<0.20

Signed by: Sandra Kaluza - Laboratory Coordinator
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Place and date of issue: Deer Park - 07-02-2020

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