

BUCKEYE PIPE LINE COMPANY, L.P.
BUCKEYE PIPE LINE TRANSPORTATION, LLC
LAUREL PIPE LINE COMPANY, L.P.
NORCO PIPE LINE COMPANY, LLC
WOOD RIVER PIPE LINES, LLC

FUNGIBLE

PRODUCT GRADE SPECIFICATIONS

6.3 PRODUCT GRADE SPECIFICATIONS

This section contains specifications for products which are handled on a fungible or common-stream basis. A "fungible batch" is defined as a batch of petroleum product meeting Carrier's specifications which may be commingled with other batches of petroleum product meeting the same specifications.

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TABLE 1

Approved GUM INHIBITORS AND METAL DEACTIVATORS

For Gasoline

This product may, but is not required to, contain the following:

N, N'di-secondary butyl para-phenylenediamine	N, N'disalicylidene-1, 2 propanediamine
2, 6-di-tertiary butyl 4 methyl phenol	N, N'di (1-ethyl-2-methylpentyl) para-phenylenediamine
N, N'di-isopropyl-para-phenylenediamine	N, N'bis- (1, 4-dimethylpentyl) -p-phenylenediamine
N-Butyl para-aminophenol	2,4,6 - tritertiary butylphenol
Ortho-tertiary butylphenol	2,4-diamethyl-6-tertiary-butylphenol
2,4-di-tertiary butylphenol	2,6-di-tertiary butylphenol
N, secondary butyl, N' phenyl-para-phenylenediamine	Butylated ethyl, methyl and dimethyl phenols
Mixed propylated and butylated phenols	2,4,6 tri-isopropylphenol

Approved CORROSION INHIBITORS

For Gasoline

This product may, but is not required to, contain the following:

Nalco 5403	Spec-Aid 8Q22	Innospec DCI-4A	Tolad 245	Lubrizol 541
Nalco 5405	Spec-Aid 8Q100	Innospec DCI-6A	Tolad 249	Lubrizol 8014
Nalco 5406	Spec-Aid 8Q101	Innospec DCI-11	Tolad 351	Lubrizol 8017
Nalco EC5624A	Spec-Aid 8Q102	Innospec DCI-30.N	Tolad 3232	Afton Chemical HiTEC 4875
Nalco EC5626A	Spec-Aid 8Q103	UOP Unicor	Tolad 3232D	Afton Chemical HiTEC 6455
Unichem 7500	Spec-Aid 8Q106	UOP Unicor J	Tolad 4410	Mobil C-605
Unichem 7501	Spec-Aid 8Q109	UOP Unicor PL	Tolad 9711	Aqua Process 11CH77
Unichem 7510	Spec-Aid 8Q110	Champion RPS-622	Tolad 9715	Corexit 5267
MidContinental Chem. MCC5001	Spec-Aid 8Q112ULS	Champion RPS-807	Tolad 9719	
	Spec-Aid 8Q123ULS	Ethyl HiTec 580		

For Diesel Fuels and Fuel Oil

In addition to the above additives, the following may be used:

Dupont	AFA-1
Innospec	DMA-4
Nalco	EC 5407-A
Nalco	5400-A
Tolad	3032
Infineum	R511

NOTE: All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).

AVIATION (JET FUEL) ADDITIVES

Product shall only contain antioxidants and metal deactivators specified and within the concentration noted in the latest ASTM D1655 with advance approval from Buckeye prior to shipment. Use of these additives is expected to be short term at reasonable treat levels, and is to be clearly indicated on the CoA. All other additives are prohibited. Buckeye reserves the right to deny shipment of product containing these additives. In addition, scheduling and Measurement & Quality Control must be notified at least 72 hours prior to the scheduled shipment of any batches containing Metal Deactivator Additive (MDA). If MDA has been added to the product, Buckeye reserves the right to refuse shipment. If requesting to move a batch that has been treated with MDA, supply the following information to Buckeye Measurement & Quality Control: (1) the purpose for adding MDA, (2) a breakdown of total metals present in the jet fuel before treating with MDA, (3) JFTOT test results both prior to and after adding MDA, (4) MDA treat rate, and (5) MDA product used.

TABLE 2 - SEASONAL GASOLINE REQUIREMENTS

REID VAPOR PRESSURE (RVP)

The following schedule denotes the volatility properties as required by Buckeye and may not coincide with dates specified by appropriate government agencies. Some systems within Buckeye may require earlier dates for summer RVP limits in order to ensure compliance with EPA federal regulations. Shippers will be advised in advance of the date that fungible gasolines must be input into the Buckeye System via the scheduling calendar. Buckeye will use a Grabner vapor pressure instrument to monitor RVP compliance, per ASTM D5191, but will use the coefficients recommended by EPA, i.e. 956X - 0.347.

DISTILLATION CLASSES: ASTM D-86

CLASS	A	C	D	E
10% Evap., Deg F (Deg C) Max.	158 (70)	140 (60)	131 (55)	122 (50)
50% Evap., Deg F (Deg C) Min. ⁽¹⁾	170 (77)	170 (77)	170 (77)	170 (77)
50% Evap., Deg F (Deg C) Max.	250 (121)	240 (116)	235 (113)	230 (110)
90% Evap., Deg F (Deg C) Max.	374 (190)	365 (185)	365 (185)	365 (185)
End Point, Deg F (Deg C) Max.	430 (221)	430 (221)	430 (221)	430 (221)
Driveability Index Deg F (Deg C) Max. ⁽²⁾	1250 (597)	1230 (586)	1220 (580)	1200 (569)

CLASS	1	2	3	4	5
Min Vapor/Liquid Ratio (TV/L) 20 °F (°C) [ASTM D-5188] ¹	133 (56)	133 (56)	124 (48)	116 (47)	105 (41)

Approximate Origin Maximum RVP and Distillation Requirements¹

Destination		Jan	Feb	Mar 1-14	Mar 15-31	Apr 1-15	Apr 16-30	May	Jun	Jul	Aug	Sep 1-15	Sep 16-30	Oct	Nov	Dec
LIS and JET (NYC/MA/CT) ⁴	psi	15.0	15.0	15.0	13.5	13.5	7.80	7.80	7.80	7.80	7.80	7.80	13.5	13.5	15.0	15.0
	dist	E-5	E-5	E-5	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
EPS/LPL/PPS (PA)	psi	15.0	15.0	13.5	13.5	9.00	9.00	9.00	9.00	9.00	9.00	9.00	13.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
EPS/PPS (Upstate NY)	psi	15.0	15.0	13.5	13.5	7.80	7.80	7.80	7.80	7.80	7.80	7.80	13.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
Pittsburgh Area ⁴	psi	15.0	15.0	13.5	13.5	7.80	7.80	7.80	7.80	7.80	7.80	7.80	13.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
Maine (To Bangor)	psi	15.0	15.0	15.0	13.5	7.80	7.80	7.80	7.80	7.80	7.80	7.80	13.5	13.5	15.0	15.0
	dist	E-5	E-5	E-5	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
Midwest (SE Michigan)	psi	15.0	15.0	13.5	13.5	7.00	7.00	7.00	7.00	7.00	7.00	7.00	13.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
Midwest (Michigan)	psi	15.0	15.0	13.5	13.5	9.00	9.00	9.00	9.00	9.00	9.00	9.00	13.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	D-4	D-4	E-5	E-5
Wood River (St. Louis) ⁴	psi	15.0	15.0	13.5	13.5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	11.5	13.5	13.5	15.0
	dist	E-5	E-5	D-4	D-4	D-4	A-3	A-3	A-3	A-2	A-2	A-2	C-3	D-4	D-4	E-5
Midwest and Wood River (All other)	psi	15.0	15.0	13.5	13.5	9.00	9.00	9.00	9.00	9.00	9.00	9.00	11.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-4	A-4	A-3	A-3	A-3	A-3	A-3	C-3	D-4	E-5	E-5
Lower V (Dubuque to IA)	psi	15.0	15.0	13.5	13.5	9.00	9.00	9.00	9.00	9.00	9.00	9.00	11.5	13.5	15.0	15.0
	dist	E-5	E-5	D-4	D-4	A-3	A-3	A-3	A-3	A-3	A-3	A-3	C-3	D-4	E-5	E-5
Lower V (Dubuque to MO and KS)	psi	15.0	13.5	13.5	11.5	9.00	9.00	9.00	9.00	9.00	9.00	9.00	11.5	13.5	13.5	15.0
	dist	E-5	D-4	D-4	C-3	A-3	A-3	A-2	A-2	A-2	A-2	A-2	C-3	D-4	D-4	E-5
Lower V (Low RVP Areas)	psi	15.0	13.5	11.5	11.5	6.80	6.80	6.80	6.80	6.80	6.80	6.80	11.5	13.5	13.5	15.0
	dist	E-5	D-4	C-3	C-3	A-2	A-2	A-2	A-2	A-2	A-2	A-2	C-3	D-4	D-4	E-5

(1) Computer and Linear methods may be used to determine TV/L value. D5188 will be the referee method. TV/L and T50 limits provided in Table 2 are for the base gasoline only; additional TV/L and T50 limits for ethanol blended gasoline are found in individual Grade Code specifications. T50, TV/L and RVP limits for all RBOB's and gasoline must comply with the applicable requirements of the area in which the fuel is destined for retail. Maximum Distillation residue is 2% Vol for all base gasoline.

(2) The DI (Driveability Index) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2 and are not subject to correction for precision of the test method.

(3) Refer to Product Grade Specification for specific RVP requirements. For products blended to meet EPA or state imposed volatility requirements, RVP test must be performed in accordance with methods published in 40 CFR Part 80.

(4) The 7.8 lb. RVP limit for NYC, MA, CT, and Pittsburgh is after 10% ethanol blend. The 8.0 lb RVP limit for St. Louis is after 10% ethanol blend.

BUCKEYE PARTNERS, L.P.
(MIDWEST PRODUCTS SYSTEM ONLY)
SPECIFICATIONS FOR FUNGIBLE NORMAL BUTANE
GRADE 086

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Vapor Pressure, psig @ 100° F	D1267, D2598, D6897		56	1
Relative Density @ 60/60° F	D1657, D2598	0.560	0.600	
Volatile Residue				
Temperature @ 95% evaporated °F	D1837		36	
OR				
Pentane and Heavier, Vol. %	D2163		2.0	
Corrosion, copper	D1838		1	
Sulfur, ppmw	D2784; D6667		10 30	
Fluorides, ppmw	UOP619		1.4	
Analysis, liq. Vol. % -	D2163			
Propane			2.5	
Total butane Composition		95.0		
Isobutane			6.0	
Normal butane		94.0		
Pentanes and Heavier			2.0	
Butadiene			0.01	
Total Olefins			1.0	
Total Aromatics			2.0	
Benzene			0.03	
Free Water		None		

NOTES:

1. D1267 is the referee method.

BUCKEYE PARTNERS, L.P.
(MIDWEST PRODUCTS SYSTEM ONLY)
SPECIFICATIONS FOR FUNGIBLE PROPANE
GRADE 088

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Vapor Pressure, psig @ 100° F	D1267, D2598, D6897		208	2
Relative Density @ 60/60° F	D1657, D2598	0.500	0.515	
Volatile Residue				
Temperature @ 95% evaporated °F	D1837		-37	
OR				
Butanes and heavier, Vol. %	D2163		2.5	
OR				
Residual Matter				
Residue on evaporation of				
100 ml., ml	D2158		0.05	
Oil Stain			Pass	1
Corrosion, copper	D1838		1	
Sulfur, ppmw	D2784, D6667		123	
Analysis, liq. Vol. %				
Propylene			5.0	
Propane		90.0		
Moisture/Free Water Content	D2713		Pass/None	
Hydrogen sulfide	D2420		Pass	

NOTES:

1. An acceptable product shall not yield a persistent oil ring when 0.3 ml of solvent residue is added in 0.1 ml increments; after examination in daylight after 2 minutes as described in D2158.
2. D1267 is the referee method.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE LOW SULFUR DIESEL (LM500)
GRADE 130

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Gravity, API @ 60°F	D287, D4052	30		
Flash Point, °F (at Origin)	D93 or D56	130		1
Color, ASTM	D1500		2.5	
Viscosity, cst @ 104°F	D445	1.9	3.4	
Cloud Point, °F (Sept thru March)	D2500, D5771, D5772,		+15 °F / -9 °C	
(April thru August)	D5773, D3117		+20 °F / -7 °C	
Pour Point, °F (Sept thru March)	D5985, D5949, D5950, D97		0 °F / -18 °C	
(April thru August)			+10°F/ -12 °C	
Total Sulfur, wt. %	D1266, D2622, D4294 D5453		0.042	
Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml or	D2274		2.5	
Thermal Stability, 90 minutes				
150°C Pad rating	DuPont		7	
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Cetane Number or Index	D4737, D613, D6890, D7170	40		
Aromatics (Vol%)	D1319		35.0	
or Aromatics by Cetane Index	D976	40		
Physical Distillation, °F	D86			
50% recovered		Report		
90% recovered		540	640	
End Point			690	
OR Simulated Distillation, °F	D2887			
50% recovered		Report		
90% recovered		572	673	
End Point			790	
Haze Rating @ 77°F	D4176		2	
Procedure 2				
Color Visual		Undyed		4
Additives				5
NACE	TM0172-2001	B+		7

NOTES:

- Test method D-56 may be used as an alternate to D-93 with the same limits. Test method D-93 is the referee method. Minimum flash at delivery is 125 °F.
- Intended to be consistent with ASTM D975 Grade No. 2 middle distillate fuels, unless otherwise noted.
- Reserved
- Product must exhibit no visible evidence of dye.
- Use of static dissipater additive or conductivity improver is prohibited.
- The use of lubricity improver additives is prohibited.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- This product is for Non-Road use and should be designated as such in the EPA's Designate and Track reporting system: DNR500 through May 31, 2012, DNRLM as of June 1, 2012, LM500 as of June 1, 2014.
- Biofuel Components (e.g. biodiesel) are not permitted in this product.
- Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE LOW SULFUR DIESEL (LM500)
GRADE 132
(BUCKEYE-MIDWEST PIPELINE SYSTEM AND WOOD RIVER SYSTEM)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Gravity, API @ 60°F	D287, D4052	30		
Flash Point, °F (at Origin)	D93 or D56	130		1
Color, ASTM	D1500		2.5	
Viscosity, cst @ 104°F	D445	1.9	3.4	
Cloud Point, °F (Sept thru March) (April thru August)	D2500, D5771, D5772, D5773, D3117		+15 °F / -9 °C +20 °F / -7 °C	
Pour Point, °F (Sept thru March) (April thru August)	D5985, D5949, D5950, D97		0 °F / -18 °C +10°F/ -12 °C	
Total Sulfur, wt. %	D1266, D2622 or D4294 D5453		0.042	
Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml or Thermal Stability, 90 minutes 150°C Pad rating	D2274 DuPont		2.5 7	
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Cetane Number or Index	D4737, D613, D6890, D7170	40		
Aromatics (Vol%)	D1319		35.0	
or Aromatics by Cetane Index	D976	40		
Physical Distillation, °F	D86			
50% recovered		Report		
90% recovered		540	640	
End Point			690	
OR Simulated Distillation, °F	D2887			
50% recovered		Report		
90% recovered		572	673	
End Point			790	
Haze Rating @ 77°F Procedure 2	D4176		2	
Color Visual		Undyed		4
Additives				5
NACE	TM0172-2001	B+		7

NOTES:

- Test method D-56 may be used as an alternate to D-93 with the same limits. Test method D-93 is the referee method. Minimum flash at delivery is 125 °F.
- Intended to be consistent with ASTM D975 Grade No. 2 middle distillate fuels, unless otherwise noted.
- Reserved
- Product must exhibit no visible evidence of dye.
- Use of static dissipater additive or conductivity improver is prohibited.
- The use of lubricity improver additives is prohibited.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- This product is for Non-Road use and should be designated as such in the EPA's Designate and Track reporting system: DNR500 through May 31, 2012, DNRLM as of June 1, 2012, LM500 as of June 1, 2014.
- Biofuel Components (e.g. biodiesel) are not permitted in this product.
- Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR ULTRA LOW SULFUR DIESEL #1 (NON-ROAD)
GRADE 150

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Appearance	White Bucket	Report		1
Gravity, API @ 60°F	D287, D1298 or D4052	37	51	
Color, at origin	D156, D6045	18		1
at delivery		+16		
Corrosion, 2 hrs. @ 212°F	D130		1	
Cetane (Number or Index)	D976, D4737, D613, D6890	40		
Total Sulfur, ppm (at receipt)	D5453, D4294		11	5,7,8,9
Doctor Test	D4952		Negative	
OR				
Mercaptan Sulfur, wt. %	D3227		0.003	3
Aromatics, vol. %	D1319		25	
Flash Point, °F	D56, D3828	108		
Distillation, °F	D86			
10% recovered		Report	400	
50% recovered		Report		
90% recovered		Report	550	
95% recovered		Report		
End Point			572	
or Simulated Distillation, °C(°F)	D2887			
10% recovered			185(365)	
50% recovered		Report		
90% recovered			304(579)	
End Point			340(644)	
Residue, %			1.5	
Loss, %			1.5	
Freezing Point, °F	D5972, D7153, D7154, D2386		-22	
Viscosity, cst. @ 104°F	D445	1.3	1.9	
Ash, wt %	D482		0.01	
Carbon residue, wt % on 10% bottom	D524		0.15	
Thermal Stability, 90 minutes				
150°C Pad rating	DuPont		7	
Burning Quality	D187	Report		
Electrical Conductivity	D2624	Report		2
Additives		Report		2
NACE	TM0172-2001	B+		4

NOTES:

- Product shall be clear (referring to clarity, not color) and bright and free of suspended matter, and must not exhibit various shades of green, blue or red. No peacock or abnormal color deposits.
- Only those additives accepted in Table 1 of this section will be permitted by Buckeye. Use of all additives must be approved by Buckeye prior to shipment and must be reported on the Certificate of Analysis and Preshipment Fax of Key Properties.
- Mercaptan Sulfur waived if fuel is negative by Doctor test.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- This product is for Non-Road use and should be designated as such in the EPA's Designate and Track reporting system: DNR015 through May 31, 2012, DNRLM015 as of June 1, 2012.
- Biofuel Components (e.g. biodiesel) are not permitted in this product.
- Intended to be consistent with ASTM Grade No. 1 middle distillate fuels, unless otherwise noted.
- Receipts from Wolverine Pipe Line will be accepted at a maximum of 12.0 ppm sulfur.
- Sulfur level at delivery will vary depending upon the origin and delivery location.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR ULTRA LOW SULFUR DIESEL #1 (MOTOR VEHICLE)
GRADE 151

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Appearance	White Bucket	Report		1
Gravity, API @ 60°F	D287, D1298 or D4052	37	51	
Color, at origin	D156, D6045	18		
at delivery		+16		
Corrosion, 2 hrs. @ 212°F	D130		1	
Cetane (Number or Index)	D976, D4737, D613, D6890	40		
Total Sulfur, ppm (at receipt)	D5453, D4294		11	4,5,8,9
Doctor Test	D4952		Negative	
OR				
Mercaptan Sulfur, wt. %	D3227		0.003	3
Aromatics, vol. %	D1319		25	
Flash Point, °F	D56, D3828	108		
Distillation, °F	D86			
10% recovered		Report	400	
50% recovered		Report		
90% recovered		Report	550	
95% recovered		Report		
End Point			572	
or Simulated Distillation, °C(°F)	D2887			
50% recovered			Report	
90% recovered		300(572)	356(673)	
End Point			421(790)	
Residue, %			1.5	
Loss, %			1.5	
Freezing Point, °F	D5972, D7153, D7154, D2386		-22	
Viscosity, cst. @ 104°F	D445	1.3	1.9	
Ash, wt %	D482		0.01	
Carbon residue, wt % on 10% bottom	D524		0.15	
Thermal Stability, 90 minutes				
150°C Pad rating	DuPont		7	
Burning Quality	D187	Report		
Electrical Conductivity	D2624	Report		2
Additives		Report		2
NACE	TM0172-2001	B+		6

NOTES:

- Product shall be clear (referring to clarity, not color) and bright and free of suspended matter, and must not exhibit various shades of green, blue or red.
- Only those additives accepted in Table 1 of this section will be permitted by Buckeye. Use of all additives must be approved by Buckeye prior to shipment and must be reported on the Certificate of Analysis and Preshipment Fax of Key Properties.
- Mercaptan Sulfur waived if fuel is negative by Doctor test.
- This product is for Motor Vehicle use and should be designated as such in the EPA's Designate and Track reporting system: DMV015.
- Receipts from Wolverine Pipe Line will be accepted at a maximum of 12.0 ppm sulfur.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- Biofuel Components (e.g. biodiesel) are not permitted in this product.
- Intended to be consistent with ASTM Grade No. 1 middle distillate fuels, unless otherwise noted.
- Sulfur level at delivery will vary depending upon the origin and delivery location.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE AVIATION/KEROSENE
GRADE 152
 (Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Appearance	White Bucket	Report		
Color, at origin	D156, D6045	18		1
at delivery		+16		
Gravity, API @ 60°F	D287, D1298, D4052	37	51	
Net Heat of Combustion, BTU/lb.	D3338, D4809, D4529	18,400		
Corrosion, 2 hrs. @ 212°F	D130		1	
Cetane Index	D976, D4737	40		
MSEP (refinery origin)	D3948	85		
(downstream of refinery)	D7224, D3948	85		
Sulfur, wt. %	D2622, D4294, D5453		0.04	
Doctor Test, OR	D1266,			
Mercaptan Sulfur, wt. %	D4952		Negative	
Aromatics, vol. %	D3227		0.003	3
Total Acidity, mg. KOH/g	D1319		25	
Existent Gum, mg/100 ml.	D3242		0.10	
THERMAL STABILITY (JFTOT)	D381		7	
(2.5 hrs at control temperature 275°C)	D3241			4
Filter Pressure drop, mm/Hg			25	
Tube Rating: One of the following requirements shall be met:				
(1) Annex A1 VTR, VTR color code			Less than 3	
(2) Annex A2 ITR or Annex 3 ETR			No peacock or abnormal color deposits	
nm average over area of 2.5 mm ²			85	
Flash Point, °F	D56, D3828	108		
Physical Distillation, °F	D86			
10% recovered		Report	400	
50% recovered		Report		
90% recovered		Report		
End Point			572	
Residue, %			1.5	
Loss, %			1.5	
OR Simulated Distillation, °F	D2887			
10% recovered			365	
50% recovered		Report		
90% recovered			579	
End Point			644	
Freezing Point, °F	D5972, D7153, D7154, D2386		-40	
Viscosity, cst. @ -4°F	D445		8.0	
Viscosity, cst. @ 104°F	D445	1.4	1.9	
One of the following shall be met				
(1) Smoke Point, mm, or	D1322	25		
(2) Smoke Point, mm, and	D1322	18		
Naphthalenes, vol. %	D1840		3.0	
Ash, wt %	D482		0.01	
Carbon residue, wt % on 10% bottom	D524		0.15	
Burning Quality				
Time of Burning	D187		Min 16 h continuous after first weighing	
Burning Quality	IP 10		18 to 26 g/h after first weighing	
Chimney Appearance	D187		Max light white deposit (at end of test)	
Flame Characteristics	D187		Maximum variance of flame width (6mm) & flame height lowered (5 mm)	
Electrical Conductivity	D2624	Report		2
Additives		Report		2

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE AVIATION/KEROSENE
GRADE 152
(Page 2 of 2)

NOTES:

1. Product shall be clear (referring to clarity, not color) and bright and free of suspended matter, and must not exhibit various shades of green, blue or red.
2. Product shall only contain antioxidants and metal deactivators specified and within the concentration noted in the latest ASTM D1655 with advance approval from Buckeye prior to shipment. Use of these additives is expected to be short term at reasonable treat levels, and is to be clearly indicated on the CoA. All other additives are prohibited. Buckeye reserves the right to deny shipment of product containing these additives. In addition, scheduling and Measurement & Quality Control must be notified at least 72 hours prior to the scheduled shipment of any batches containing Metal Deactivator Additive (MDA). If MDA has been added to the product, Buckeye reserves the right to refuse shipment. If requesting to move a batch that has been treated with MDA, supply the following information to Buckeye Measurement & Quality Control: (1) the purpose for adding MDA, (2) JFTOT test results both prior to and after adding MDA, (3) MDA treat rate, and (4) MDA product used.
3. Mercaptan Sulfur waived if fuel is negative by Doctor test.
4. Refer to ASTM D1655 note M for referee method.
5. Product must comply with ASTM D1655 specifications in addition to Buckeye product specifications. Buckeye will accept test methods that are listed in ASTM D1655. Test methods listed above are considered referee methods by Buckeye Pipe Line.
6. This product is for use as aviation fuel or home heat and should be designated as "Kerosene" in the EPA's Designate and Track reporting system.
7. Biofuel Components (e.g. biodiesel) are not permitted in this product.
8. Intended to be consistent with ASTM D3699 and D1655, unless otherwise noted

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE No. 1 KEROSENE FUEL OIL 400 PPM SULFUR
GRADE 154

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color, at origin	D156, D6045	18		1
at delivery		+16		
Gravity, API @ 60°F	D287, D1298, D4052	37	51	
Corrosion, 3 hrs. @ 212°F	D130		1	
Sulfur, ppm (at receipt)	D2622, D4294, D1266, D1552		400	
Doctor Test	D4952		Negative	
OR				
Mercaptan Sulfur, mass %	D3227		0.003	2
Flash Point, °F	D56, D3828	108		
Physical Distillation, °F	D86			
10% recovered			419	
90% recovered			550	
End Point			572	
Freezing Point, °F	D5972, D7153, D7154, D2386		-22	
Viscosity, cst. @ 104°F	D445	1.3	1.9	
Carbon residue, wt % on 10% bottom	D524		0.15	
Burn Quality				
Time of Burning	D187		Min 16 h continuous after first weighing	
Burning Quality	IP 10		18 to 26 g/h after first weighing	
Chimney Appearance	D187		Max light white deposit (at end of test)	
Flame Characteristics	D187		Maximum variance of flame width (6mm) & flame height lowered (5 mm)	
Pour Point, °F	D5985, D5949, D5950, D97		0 °F /-18 °C	
Sediment and Water, % by volume	D2709		0.05	
NACE	TM0172-2001	B+		3
Smoke Point	D1322	18		

NOTES:

1. Product shall be clear (referring to clarity, not color) and bright and free of suspended matter.
2. Mercaptan Sulfur waived if fuel is negative by Doctor test.
3. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
4. This product should be designated as "Kerosene" in the EPA's Designate and Track reporting system.
5. Biofuel Components (e.g. biodiesel) are not permitted in this product.
6. Intended to be consistent with ASTM D3699, unless otherwise noted

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE ULSD-1(MOTOR VEHICLE)/AVIATION/ULSK
GRADE 155
 (Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Appearance	White Bucket	Report		
Color, at origin	D156, D6045	18		1
at delivery		+16		
Gravity, API @ 60°F	D287, D1298 or D4052	37	51	
Net Heat of Combustion, BTU/lb.	D3338, D4809, D4529	18,400		
Corrosion, 2 hrs. @ 212°F	D130		1	
Cetane Index	D976, D4737	40		
MSEP (refinery origin)	D3948	85		
(downstream of refinery)	D7224, D3948	85		
Sulfur, ppm (at receipt)	D2622, D4294, D5453		11	5,9
D1266,				
Doctor Test, OR	D4952		Negative	
Mercaptan Sulfur, wt. %	D3227		0.003	3
Aromatics, vol. %	D1319		25	
Total Acidity, mg. KOH/g	D3242		0.10	
Existent Gum, mg/100 ml.	D381		7	
THERMAL STABILITY (JFTOT)	D3241			4
(2.5 hrs at control temperature 275°C)				
Filter Pressure drop, mm/Hg			25	
Tube Rating: One of the following requirements shall be met:				
(1) Annex A1 VTR, VTR color code			Less than 3	
(2) Annex A2 ITR or Annex 3 ETR			No peacock or abnormal color deposits	
nm average over area of 2.5 mm ²			85	
Flash Point, °F	D56, D3828	108		
Distillation, °F	D86			
10% recovered		Report	400	
50% recovered		Report		
90% recovered		Report	550	
End Point			572	
Residue, %			1.5	
Loss, %			1.5	
OR Simulated Distillation, °F	D2887			
10% recovered			365	
50% recovered		Report		
90% recovered			579	
End Point			644	
Freezing Point, °F	D5972, D7153, D7154, D2386		-40	
Viscosity, cst. @ -4°F	D445		8.0	
Viscosity, cst. @ 104°F	D445	1.4	1.9	
Smoke Point or	D1322	25		
Smoke Point and	D1322	18		
Naphthalenes, vol. %	D1840		3.0	
Ash, wt %	D482		0.01	
Carbon residue, wt % on 10% bottom	D524		0.15	
Burn Quality				
Time of Burning	D187		Min 16 h continuous after first weighing	
Burning Quality	IP 10		18 to 26 g/h after first weighing	
Chimney Appearance	D187		Max light white deposit (at end of test)	
Flame Characteristics	D187		Maximum variance of flame width (6mm) & flame height lowered (5 mm)	
Electrical Conductivity	D2624	Report		2
Additives		Report		2

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE ULSD-1 (MOTOR VEHICLE) / AVIATION / ULSK
GRADE 155

(Page 2 of 2)

NOTES:

1. Product shall be clear (referring to clarity, not color) and bright and free of suspended matter, and must not exhibit various shades of green, blue or red.
2. Product shall only contain antioxidants and metal deactivators specified and within the concentration noted in the latest ASTM D1655 with advance approval from Buckeye prior to shipment. Use of these additives is expected to be short term at reasonable treat levels, and is to be clearly indicated on the CoA. All other additives are prohibited. Buckeye reserves the right to deny shipment of product containing these additives. In addition, Scheduling and Measurement & Quality Control must be notified at least 72 hours prior to the scheduled shipment of any batches containing Metal Deactivator Additive (MDA). If MDA has been added to the product, Buckeye reserves the right to refuse shipment. If requesting to move a batch that has been treated with MDA, supply the following information to Buckeye Measurement & Quality Control: (1) the purpose for adding MDA, (2) JFTOT test results both prior to and after adding MDA, (3) MDA treat rate, and (4) MDA product used.
3. Mercaptan Sulfur waived if fuel is negative by Doctor test.
4. Refer to ASTM D1655 note M for referee method.
5. Sulfur level at delivery will vary depending upon the origin and delivery location.
6. Product must comply with ASTM D1655 specifications in addition to Buckeye product specifications. Buckeye will accept test methods that are listed in ASTM D1655. Test methods listed above are considered referee methods by Buckeye Pipe Line.
7. This product is for Motor Vehicle use and should be designated as such in the EPA's Designate and Track reporting system: DMV015.
8. Biofuel Components (e.g. biodiesel) are not permitted in this product.
9. Receipts from Wolverine Pipe Line will be accepted at a maximum of 12.0 ppm sulfur.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE HEATING OIL – DYED HIGH SULFUR
GRADE 159 (500 PPM), GRADE 160 (2000 PPM), GRADE 161 (5000 PPM), &
GRADE 165 (3000 PPM)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Gravity, API @ 60°F	D287, D4052	30		
Flash Point, °F(at Origin)	D93, D56	116	1	
Viscosity, cst @ 104°F	D445	1.9	4.1	
Cloud Point, °F (Sept thru March) (April thru August)	D2500, D5771, D5772, D5773, D3117		+15 °F / -9 °C +20 °F / -7 °C	
Pour Point, °F (Sept thru March) (April thru August)	D5985, D5949, D5950, D97		0 °F / -18 °C +10°F/ -12 °C	
Total Sulfur, wt. %	D7039, D2622, D4294, D5453		See below Table	

High Sulfur Heating Oil Maximum Sulfur Table

Grade Code	Max Sulfur, wt %
159	0.045
160	0.20
161	0.50
165	0.30

Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml or Thermal Stability, 90 minutes 150°C Pad rating	D2274 DuPont		2.5 7	
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Physical Distillation, °F 50% recovered 90% recovered End Point	D86	Report 540	640 690	
OR Simulated Distillation, °F 50% recovered 90% recovered End Point	D2887	Report 572	673 790	
Haze Rating @ 77°F	D4176 (Procedure 2)		2	
Biodiesel (FAME) %	D7371, EN14078		0.0	5, 8
Dye Content, ppm (at Origin)	D6258 or Petrospec DT100	13.0	16.0	2
NACE	TM0172-2001	B+		4

NOTES:

1. Test method D-56 may be used. Test method D-93 is the referee method. Minimum flash at delivery is 108 °F.
2. This product must contain red dye, standard solvent Red 26 or solvent Red 164, in concentrations of 4.6 lbs. or 6.6 lbs., respectively, of active dry ingredient per 1,000 barrels. Product must meet a maximum color of 2.5 per ASTM D1500 prior to introduction of dye.
3. The use of lubricity improver additives is prohibited.
4. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
5. Biofuel Components (e.g. biodiesel, FAME) are not permitted in this product. Results must be <LDL of the test method (i.e. <1.0% per D7371, or <0.50% per EN14078). FAME limits go into effect at Linden, NJ; Booth, PA; Macungie, PA; and New Haven, CT on June 1, 2014. FAME Limits will apply to all other receipt locations on September 5, 2014.
6. This product is for heating oil use and should be designated as HOUMRK per EPA's Designate & Track system.
7. Intended to be consistent with ASTM D396 Grade No. 2 middle distillate fuels, unless otherwise noted.
8. Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE HEATING OIL 15 PPM SULFUR (UNDYED)
GRADE 164

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Gravity, API @ 60°F	D287, D4052, D1298	30		
Flash Point, °F(at Origin)	D93 or D56	130		1
Color, ASTM	D1500		2.5	
Viscosity, cst @ 104°F	D445	1.9	4.1	
Cloud Point, °F (Sept thru March)	D2500, D5771, D5772,		+15 °F / -9 °C	
(April thru August)	D5773, D3117		+20 °F / -7 °C	
Pour Point, °F (Sept thru March)	D5985, D5949, D5950, D97		0 °F / -18 °C	
(April thru August)			+10°F/ -12 °C	
Total Sulfur, ppm (at receipt)	D5453, D3120, D4294 D2622, D7039		11	3,7,10
Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml OR	D2274		2.5	
Thermal Stability, 90 minutes				
150°C Pad rating OR	DuPont		7	
Thermal Stability, Y/Green	D6468	73%		
W Unit		65%		
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Cetane Number or Index	D4737,D613,D6890,D7170	40		
Aromatics (Vol%)	D1319		35.0	
or Aromatics by Cetane Index	D976	40		
Distillation, °F	D86			
50% recovered		Report		
90% recovered		540	640	
End Point			690	
or Simulated Distillation, °C(°F)	D2887			
50% recovered			Report	
90% recovered		300(572)	356(673)	
End Point			421(790)	
Haze Rating @ 77°F	D4176		2	
Procedure 2				
Biodiesel (FAME) %	D7371, EN14078		0.0	9, 11
Color Visual		Undyed		4
Additives				5
NACE	TM0172-2001	B+		8

NOTES:

- Test method D-56 may be used as an alternate to D-93 with the same limits. Test method D-93 is the referee method. Minimum flash at delivery is 125 °F.
- Intended to be consistent with ASTM D975 Grade No. 2 middle distillate fuels, unless otherwise noted.
- Receipts from Wolverine Pipe Line will be accepted at a maximum of 12.0 ppm sulfur.
- Product must exhibit no visible evidence of dye.
- Use of static dissipater additive or conductivity improver is prohibited.
- The use of lubricity improver additives is prohibited.
- This product is for heating oil use and should be designated as HOUMRK in the EPA's Designate and Track reporting system.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- Biofuel Components (e.g. biodiesel, FAME) are not permitted in this product. Results must be <LDL of the test method (i.e. <1.0% per D7371, or <0.50% per EN14078). FAME limits go into effect at Linden, NJ; Booth, PA; Macungie, PA; and New Haven, CT on June 1, 2014. FAME Limits will apply to all other receipt locations on September 5, 2014.
- Sulfur level at delivery will vary depending upon the origin and delivery location.
- Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE HEATING OIL - HIGH SULFUR UNDYED
GRADE 169 (500 PPM) & GRADE 166 (2000 PPM)

PRODUCT PROPERTY	ASTM TEST METHODS	TEST RESULTS		NOTE
		MINIMUM	MAXIMUM	
Gravity, API @ 60°F	D287, D4052	30		
Flash Point, °F(at Origin)	D93, D56	116	1	
Viscosity, cst @ 104°F	D445	1.9	4.1	
Color, ASTM	D1500, D6045		2.5	
Cloud Point, °F (Sept thru March)	D2500, D5771, D5772,		+15 °F / -9 °C	
(April thru August)	D5773, D3117		+20 °F / -7 °C	
Pour Point, °F (Sept thru March)	D5985, D5949, D5950, D97		0 °F / -18 °C	
(April thru August)			+10°F/ -12 °C	
Total Sulfur, wt. %	D7039, D2622, D4294, D5453		See below Table	

High Sulfur Heating Oil Maximum Sulfur Table

Grade Code	Max Sulfur, wt %
169	0.045
166	0.20

Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml or Thermal Stability, 90 minutes	D2274		2.5	
150°C Pad rating	DuPont		7	
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Physical Distillation, °F	D86			
50% recovered		Report		
90% recovered		540	640	
End Point			690	
OR Simulated Distillation, °F	D2887			
50% recovered		Report		
90% recovered		572	673	
End Point			790	
Haze Rating @ 77°F	D4176 (Procedure 2)		2	
Biodiesel (FAME) %	D7371, EN14078		0.0	5, 8
Color Visual		Undyed		
NACE	TM0172-2001	B+		4

NOTES:

1. Test method D-56 may be used. Test method D-93 is the referee method. Minimum flash at delivery is 108 °F.
2. ~~Product must exhibit no visible evidence of dye.~~
3. The use of lubricity improver additives is prohibited.
4. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
5. Biofuel Components (e.g. biodiesel, FAME) are not permitted in this product. Results must be <LDL of the test method (i.e. <1.0% per D7371, or <0.50% per EN14078). FAME limits go into effect at Linden, NJ; Booth, PA; Macungie, PA; and New Haven, CT on June 1, 2014. FAME Limits will apply to all other receipt locations on September 5, 2014.
6. This product is for heating oil use and should be designated as HOUMRK in the EPA's Designate and Track reporting system.
7. Intended to be consistent with ASTM D396 Grade No. 2 middle distillate fuels, unless otherwise noted.
8. Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE AVIATION KEROSENE - GRADE 182 & 188

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Appearance	White Bucket	Undyed		1
Color	D156, D6045	18		1
Gravity, API @ 60°F	D287, D1298, D4052	37	51	
Net Heat of Combustion, BTU/lb.	D3338, D4529, D4809	18,400		
Corrosion, 2 hrs. @ 212°F	D130		1	
MSEP (refinery origin)	D3948	85		
(downstream of refinery)	D7224, D3948	85		
Sulfur, wt. %	D2622, D4294, D5453, D1266		See below Table	

Jet Fuel Maximum Sulfur Table

Grade Code	Max Sulfur, wt %
182	0.30
188	0.0011

Doctor Test OR	D4952		Negative (Sweet)	
Mercaptan Sulfur, wt. %	D3227		0.003	3
Aromatics, vol. %	D1319		25	
Total Acidity, mg. KOH/g	D3242		0.10	
Existent Gum, mg/100 ml.	D381		7	
THERMAL STABILITY (JFTOT)	D3241			4
(2.5 hrs at control temperature 275°C)				
Filter Pressure drop, mm/Hg			25	
Tube Rating: One of the following requirements shall be met:				
(1) Annex A1 VTR, VTR color code				
Less than 3				
No peacock or abnormal color deposits				
(2) Annex A2 ITR or Annex 3 ETR				
nm average over area of 2.5 mm ²				
Flash Point, °F	D56, D3828	108	85	
Distillation, °F	D86			
10% recovered			400	
50% recovered		Report		
90% recovered		Report		
End Point			572	
Residue, %			1.5	
Loss, %			1.5	
OR Simulated Distillation, °F	D2887			
10% recovered			365	
50% recovered		Report		
90% recovered		Report	579	
End Point			644	
Freezing Point, °F	D5972, D7153, D7154, D2386		-40	
Viscosity, cst. @ -4°F	D445		8.0	
One of the following shall be met				
(1) Smoke Point, mm, or				
(2) Smoke Point, mm, and				
Naphthalenes, vol. %				
Electrical Conductivity	D2624	Report		2
Additives		Report		2

NOTES:

- Product shall be clear (referring to clarity, not color) and bright and free of suspended matter, and must not exhibit various shades of green, blue or red.
- Product shall only contain antioxidants and metal deactivators specified and within the concentration noted in the latest ASTM D1655 with advance approval from Buckeye prior to shipment. Use of these additives is expected to be short term at reasonable treat levels, and is to be clearly indicated on the CoA. All other additives are prohibited. Buckeye reserves the right to deny shipment of product containing these additives. In addition, Scheduling and Measurement & Quality Control must be notified at least 72 hours prior to the scheduled shipment of any batches containing Metal Deactivator Additive (MDA). If MDA has been added to the product, Buckeye reserves the right to refuse shipment. If requesting to move a batch that has been treated with MDA, supply the following information to Buckeye Measurement & Quality Control: (1) the purpose for adding MDA, (2) JFTOT test results both prior to and after adding MDA, (3) MDA treat rate, and (4) MDA product used.
- Mercaptan Sulfur waived if fuel is negative by Doctor test.
- Refer to ASTM D1655 note M for referee method.
- Product must comply with ASTM D1655 specifications in addition to Buckeye product specifications. Buckeye will accept test methods that are listed in ASTM D1655. Test methods listed above are considered referee methods by Buckeye Pipe Line.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE ULTRA LOW SULFUR DIESEL (MOTOR VEHICLE)
GRADE 190

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Gravity, API @ 60°F	D287, D4052, D1298	30		
Flash Point, °F(at Origin)	D93 or D56	130		1
(Maine only - Dec thru March 14)		120		6
Color, ASTM	D1500		2.5	
Viscosity, cst @ 104°F	D445	1.9	4.1	
(Maine only - Dec thru March 14)		1.7		6
Cloud Point, °F (Sept thru March)	D2500, D5771, D5772,		+15 °F / -9 °C	
(April thru August)	D5773, D3117		+20 °F / -7 °C	
(Maine only - Dec thru March 14)			-16 °F / -26 °C	6
Pour Point, °F (Sept thru March)	D5985, D5949, D5950, D97		0 °F / -18 °C	
(April thru August)			+10°F/ -12 °C	
Total Sulfur, ppm (at receipt)	D5453, D3120, D2622, D7039, D4294		11	3,7,8
Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml OR	D2274		2.5	
Thermal Stability, 90 minutes				
150°C Pad rating OR	DuPont		7	
Thermal Stability, Y/Green	D6468	73%		
W Unit		65%		
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Cetane Number or Index	D4737,D613,D6890,D7170	40		
Aromatics (Vol%)	D1319		35.0	
or Aromatics by Cetane Index	D976	40		
Distillation, °F	D86			
50% recovered		Report		
90% recovered		540	640	
End Point			690	
or Simulated Distillation, °C(°F)	D2887			
50% recovered			Report	
90% recovered		300(572)	356(673)	
End Point			421(790)	
Haze Rating @ 77°F	D4176		2	
Procedure 2				
Biodiesel (FAME) %	D7371, EN14078		0.0	10,11
Color Visual		Undyed		4
Additives				5
NACE	TM0172-2001	B+		9

NOTES:

- Test method D-56 may be used as an alternate to D-93 with the same limits. Test method D-93 is the referee method. Minimum flash at delivery is 125 °F.
- Intended to be consistent with ASTM D975 Grade No. 2 middle distillate fuels, unless otherwise noted.
- Receipts from Wolverine Pipe Line will be accepted at a maximum of 12.0 ppm sulfur.
- Product must exhibit no visible evidence of dye.
- Use of static dissipater additive or conductivity improver or lubricity improver additive is prohibited.
- For winter (December 1 through March 14) receipt of ULSD in State of Maine only.
- This product is for Motor Vehicle use and designated as such in EPA's Designate and Track reporting system: DMV015.
- Sulfur level at delivery will vary depending upon the origin and delivery location.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- Biofuel Components (e.g. biodiesel, FAME) are not permitted in this product. Results must be <LDL of the test method (i.e. <1.0% per D7371, or <0.50% per EN14078). FAME limits go into effect at Linden, NJ; Booth, PA; Macungie, PA; and New Haven, CT on June 1, 2014. FAME Limits will apply to all other receipt locations on September 5, 2014.
- Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE ULTRA LOW SULFUR DIESEL (NON-ROAD)
GRADE 193

PRODUCT PROPERTY	ASTM TEST METHODS	TEST RESULTS		NOTE
		MINIMUM	MAXIMUM	
Gravity, API @ 60°F	D287, D4052, D1298	30		
Flash Point, °F(at Origin)	D93 or D56	130		1
Color, ASTM	D1500		2.5	
Viscosity, cst @ 104°F	D445	1.9	4.1	
Cloud Point, °F (Sept thru March)	D2500, D5771, D5772,		+15 °F / -9 °C	
(April thru August)	D5773, D3117		+20 °F / -7 °C	
Pour Point, °F (Sept thru March)	D5985, D5949, D5950, D97		0 °F / -18 °C	
(April thru August)			+10°F/ -12 °C	
Total Sulfur, ppm (at receipt)	D5453, D312, D4294 D2622, D7039		11	3,7,8
Corrosion, 3 hrs. @ 122°F	D130		1	
Oxidation Stability, mg/100 ml OR	D2274		2.5	
Thermal Stability, 90 minutes				
150°C Pad rating OR	DuPont		7	
Thermal Stability, Y/Green	D6468	73%		
W Unit		65%		
Carbon Residue, wt. % on 10% bottom	D524 or D4530		0.35	
Ash, wt. %	D482		0.01	
Sediment and Water, % by volume	D2709		0.05	
Cetane Number or Index	D4737, D613, D6890, D7170	40		
Aromatics (Vol%)	D1319		35.0	
or Aromatics by Cetane Index	D976	40		
Distillation, °F	D86			
50% recovered		Report		
90% recovered		540	640	
End Point			690	
or Simulated Distillation, °C(°F)	D2887			
50% recovered			Report	
90% recovered		300(572)	356(673)	
End Point			421(790)	
Haze Rating @ 77°F	D4176		2	
Procedure 2				
Biodiesel (FAME) %	D7371, EN14078		0.0	10,11
Color Visual		Undyed		4
Additives				5, 6
NACE	TM0172-2001	B+		9

NOTES:

- Test method D-56 may be used as an alternate to D-93 with the same limits. Test method D-93 is the referee method. Minimum flash at delivery is 125 °F.
- Intended to be consistent with ASTM D975 Grade No. 2 middle distillate fuels, unless otherwise noted.
- Receipts from Wolverine Pipe Line will be accepted at a maximum of 12.0 ppm sulfur.
- Product must exhibit no visible evidence of dye.
- Use of static dissipater additive or conductivity improver is prohibited.
- The use of lubricity improver additives is prohibited.
- This product is for Non-Road use and should be designated as DNR015 in the EPA's Designate and Track system.
- Sulfur level at delivery will vary depending upon the origin and delivery location.
- All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
- Biofuel Components (e.g. biodiesel, FAME) are not permitted in this product. Results must be <LDL of the test method (i.e. <1.0% per D7371, or <0.50% per EN14078). FAME limits go into effect at Linden, NJ; Booth, PA; Macungie, PA; and New Haven, CT on June 1, 2014. FAME Limits will apply to all other receipt locations on September 5, 2014.
- Shipments of this Grade Code are limited to less than 5.0% renewable diesel. Renewable diesel is a liquid fuel derived from 100% hydrotreated biomass that meets the registration requirements for fuels and fuel additives established by the EPA under Section 211 of the Clean Air Act and the requirements of ASTM D975. Fuel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE FULL OCTANE CONVENTIONAL GASOLINE
REGULAR GRADES 302, 312, 322, & 332
PREMIUM GRADES 305, 315, 325, & 335
 (Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color			Undyed	
Gravity, API @ 60°F	D287, D1298, D4052	Report		
Corrosion, 3 hrs. @ 122°F	D130		1	1
Octane Rating				
Research Number	D2699, D2885	Report		
Regular Gasoline Grades (Grades 302, 312, 322, 332)	D2700, D2885			
Motor Number		82.0		
Index, (R+M)/2		87.0		
Premium Gasoline Codes Grades (305, 315, 325, 335)				
Motor Number		Report		
Index, (R+M)/2		93.0		
Oxygenates, vol. %	D4815, D5599, D5845	Report		2
Benzene, vol. %	D3606, D4053, D5443	3.8		
Sulfur, wt. %	D2622, D5453, D3120, D7039	0.0080		
Doctor Test OR	D4952	Negative		3
Mercaptan Sulfur, wt. %	D3227	0.002		
Lead Content, gms/gal	D3237, D5059	0.01		
Phosphorous, gms/gal	D3231	0.004		
Solvent washed Gum, mg/100ml	D381		4	
Oxidation Stability, minutes	D525	240		
Odor		Nonoffensive		4
Port Fuel Injector and Intake Valve Detergent Additives				5
Corrosion Inhibitors, Gum Inhibitors and Metal Deactivators – Refer to Table 1				
Volatility and Distillation – Refer to Table 2				
MMT				6
Driveability Index	D4814	Refer to Table 2 (pg 5)		7
TV/L 20, Deg F	D5188	Refer to Table 2 (pg 5)		
Silver Strip Corrosion	D7667, D7671		1	
NACE	TM0172-2001	B+		8
RVP, psi (without ethanol)	D5191, D5482		See below Table	9

Full Octane Maximum RVP Table

Grade Code	Max RVP, psi (without ethanol)
302, 305	9.00
312, 315 (Sept 16 through Oct and March 15 through March 31)*	12.9*
312, 315 (Nov through March 15)*	14.5*
322, 325	7.80
332, 335	6.80

*Grade Code 312 & 315 - Eastern Products and Laurel: RVP limit for 13.5 months is 12.9 psi; RVP limit for 15.0 months (E-5) is 14.5 psi. Wood River, NORCO, Lower V & Midwest (excluding MI delivery locations): RVP limit for Sept 16 through Sept 30 is 11.5 psi. For all other product systems, RVP limit is 13.5 psi and 15.0 psi (refer to Table 2).

NOTES:

- No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
- This product may not contain oxygenates, such as ethers or alcohols. The use of non-hydrocarbon blending components is prohibited. The di minimis limit of MTBE, ETBE, and TAME allowed is 0.3 vol. % maximum for each compound at origin.

~~BUCKEYE PARTNERS, L.P.~~
~~SPECIFICATIONS FOR FUNGIBLE FULL OCTANE CONVENTIONAL GASOLINE~~
~~REGULAR GRADES 302, 312, 322, & 332~~
~~PREMIUM GRADES 305, 315, 325, & 335~~

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- ~~3. Mercaptan Sulfur waived if fuel is negative by Doctor test.~~
- ~~4. Any gasoline exhibiting an offensive odor and/ or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.~~
- ~~5. The use of Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.~~
- ~~6. The use of MMT octane enhancing additive is prohibited.~~
- ~~7. The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2.~~
- ~~8. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).~~
- ~~9. Beginning Sept 16 (Non VOC season), low RVP grades may be comingled with corresponding next higher RVP grade. Buckeye reserves the right to regrade to higher RVP during seasonal RVP limit increases, provided destination RVP compliance is maintained at time of delivery.~~

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE CONVENTIONAL GASOLINE
SUB-OCTANE REGULAR GRADES 308, 318, 328, 338, 348, 358, 378, ~~388 & 398~~
PREMIUM GRADES 307, 317, 327, 337, 347, 357, 377, ~~387 & 397~~

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387, 388, 397 &
398 are retired
effective July 1,
2017

SPECIFICATIONS FOR SUBGRADE GASOLINE PRIOR TO ETHANOL ADDITION

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color			Undyed	
Gravity, API @ 60°F	D287, D1298, D4052	Report		
Haze Rating @ 77°F (Procedure 2)	D4176		2	
Corrosion, 3 hrs. @ 122°F	D130		1	1
Octane Rating				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	Report		
Index, (R+M)/2 for Regular Grades (308, 318, 328, 338, 348, 358, 378, 388 & 398)		83.0		
Index, (R+M)/2 for Premium Grades (307, 317, 327, 337, 347, 357, 377, 387 & 397)		91.0		
Oxygenates, vol. %	D4815, D5599, D5845		Report	2
Benzene, vol. %	D3606, D4053, D5443		3.8	
Sulfur, wt. %	D2622, D5453, D3120, D7039		0.0080	
Doctor Test	D4952		Negative	3
Or Mercaptan Sulfur, wt. %	D3227		0.002	
Lead Content, gms/gal	D3237, D5059		0.01	
Phosphorous, gms/gal	D3231		0.004	
Solvent washed Gum, mg/100ml	D381		4	
Oxidation Stability, minutes	D525	240		
Odor		Nonoffensive		4
Port Fuel Injector, Intake Valve Detergent Additives and MMT				5, 6
Corrosion Inhibitors, Gum Inhibitors and Metal Deactivators - Refer to Table 1				
Distillation	D86	Refer to Table 2 (pg 5)		
TV/L 20, Deg F	D5188	Refer to Table 2 (pg 5)		10
Driveability Index	D4814	Refer to Table 2 (pg 5)		7
Silver Strip Corrosion	D7667, D7671		1	
NACE	TM0172-2001	B+		8
RVP, psi (without ethanol)	D5191, D5482		See below Table	9,11,12

Subgrade RVP Maximum Table

Grade Code	Max RVP, psi (without ethanol)
307, 308, 387, 388	9.00
317, 318	15.0
	14.5 (East, Laurel, Paulsboro)*
397, 398 (Midwest - See Table 2)	11.5/13.5/15.0
327, 328	7.80
337, 338	7.00 6.80
347, 348	6.60
357, 358	13.5
	12.9 (East, Laurel, Paulsboro)*
377, 378	11.5

* **Eastern Products, Paulsboro and Laurel:** RVP limit for 13.5 months is 12.9 psi; RVP limit for 15 psi months is 14.5 psi. **Wood River, NORCO, Lower V & Midwest (excluding MI delivery locations):** RVP limit for Sept 16 through Sept 30 is 11.5 psi (refer to Table 2). **For all other product systems,** RVP limit is 13.5 psi and 15.0 psi (refer to Table 2). See T4 Scheduling Calendar for RVP stepdown dates/cycles for each system.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE CONVENTIONAL GASOLINE
SUB-OCTANE REGULAR GRADES 308, 318, 328, 338, 348, 358, 378, ~~388 & 398~~
PREMIUM GRADES 307, 317, 327, 337, 347, 357, 377, ~~387 & 397~~

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SPECIFICATIONS WITH 10% DENATURED ETHANOL AS DEFINED IN ASTM D4806

PRODUCT PROPERTY	ASTM TEST METHODS	TEST RESULTS		NOTE
		MINIMUM	MAXIMUM	
Octane Rating with 10% Denatured Fuel Ethanol				
Regular Grades (308, 318, 328, 338, 348, 358, 378, 388 & 398)				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	82.0		
Index, (R+M)/2		87.0		
Premium Grades (307, 317, 327, 337, 347, 357, 377, 387 & 397)				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	Report		
Index, (R+M)/2		93.0		
RVP, psi with 10% Denatured Fuel Ethanol	D5191, D5482		See below Table	9,11,12

Subgrade RVP Maximum Table (w/ 10% denatured ethanol)

Grade Code	Max RVP, psi (with 10 vol% ethanol)
307, 308, 387, 388	10.00
317, 318	15.5 15.0 (East, Laurel, Paulsboro)*
327, 328	9.00
337, 338	8.00
347, 348	7.80
357, 358	14.5 13.5 (East, Laurel, Paulsboro)*
377, 378	12.5

Shippers are required to report E10 RVP on CoAs effective Sept 1, 2017

* Eastern Products, Paulsboro and Laurel: RVP limit for 13.5 months is 13.5 psi; RVP limit for 15.0 months is 15.0 psi. Wood River, NORCO, Lower V & Midwest (excluding MI delivery locations): RVP limit for Sept 16 through Sept 30 is 12.5 psi (refer to Table 2). For all other product systems, RVP limit is 14.5 psi and 15.5 psi (refer to Table 2). See T4 Scheduling Calendar for RVP stepdown dates/cycles for each system.

Distillation**	D86			
50% Evap (T50) with 10% Denatured Fuel Ethanol, Deg F		150	Table 2 (pg 5)	
TV/L** with 10% Den Fuel Ethanol, Deg F	D5188	See below Table		10

Subgrade TV/L Minimum Table

Class (As depicted in Table 2)	Min TV/L = 20, °F (°C) (with 10 vol% ethanol)
1	129 (54)
2	122 (50)
3	116 (47)
4	107 (42)
5	102 (39)

**Grades 337 and 338, ~~387, 388, 397 and 398~~ do not require 10% Denatured Fuel Ethanol specifications for Distillation or TVL.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE CONVENTIONAL GASOLINE
SUB-OCTANE REGULAR GRADES 308, 318, 328, 338, 348, 358, 378, ~~388 & 398~~
PREMIUM GRADES 307, 317, 327, 337, 347, 357, 377, ~~387 & 397~~

(Page 3 of 3)

NOTES:

1. No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
2. This product may not contain oxygenates, such as ethers or alcohols. The use of non-hydrocarbon blending components is prohibited. The di minimis limit of MTBE, ETBE, and TAME allowed is 0.3 vol. % maximum for each compound at origin.
3. Mercaptan Sulfur waived if fuel is negative by Doctor test.
4. Any gasoline exhibiting an offensive odor and/ or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
5. The use of Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
6. The use of MMT octane enhancing additive is prohibited.
7. The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2. DI limit can apply prior to OR after blending with 10% Denatured Fuel Ethanol.
8. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
9. Not all Grade Codes (and RVPs) are available on all pipeline systems.
10. Computer and Linear methods may be used to determine TV/L value. D5188 will be the referee method.
11. Beginning Sept 16 (Non-VOC season), low RVP grades may be comingled with corresponding next higher RVP grade. Buckeye reserves the right to regrade to higher RVP during seasonal RVP limit increases, provided destination RVP compliance is maintained at time of delivery.
12. **Suitable for the special RVP provisions for ethanol blends that contain between 9 and 10 vol% ethanol. The use of this gasoline to manufacture a gasoline-ethanol blend containing anything other than between 9 and 10 volume percent ethanol may cause a summertime RVP violation. Base gasoline - Not for sale to the ultimate consumer.**

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE VOC CONTROLLED
REFORMULATED REGULAR GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 522, 532, AND 552

(Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color			Undyed	
Gravity, API @ 60°F	D287, D1298, D4052	Report		12
Corrosion, 3 hrs. @ 122°F	D130		1	1
Octane Rating				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	82.0		
Index, (R+M)/2		87.0		
Oxygen, wt. %	D5599, GC-OFID	Report		2, 3, 9
RVP, psi	D5191		Table 2	3
Benzene, vol. %	D3606		1.30	
Doctor Test OR	D4952		Negative	4
Mercaptan Sulfur, wt. %	D3227		0.002	
Lead Content, gms/gal	D3237 or equiv.		0.01	
Phosphorous, gms/gal	D3231		0.004	
Solvent washed Gum, mg/100ml	D381		4	
Oxidation Stability, minutes	D525	240		
Aromatics, vol. %	GCMS, D5769, D1319		50.0	3
Emissions Performance Reductions				
Grade 532 - VOC Region 2, %	EPA	25.4		10
Grade 522 - VOC Reg 2 Adj (Chicago), %	EPA	23.4		
Grade 552 - VOC Region 1, %	EPA	27.0		
Olefins, vol. %	D1319, D6550		25.0	
Sulfur, wt. %	D2622, D5453, D3120, D7039		.0080	
Odor		Nonoffensive		5
Port Fuel Injector and Intake Valve Detergent Additives				6
Corrosion Inhibitors, Gum Inhibitors and Metal Deactivators - Refer to Table 1				
Distillation -	D86			
50% Evap (T50), Deg F		150	Table 2	
All other Volatility and Distillation – Refer to Table 2				
E200, vol. %	D86	30.0	70.0	
E300, vol. %	D86	70.0	100.0	
MMT				7
Driveability Index	D4814			8
Refer to Table 2				
Silver Strip Corrosion	D7667, D7671		1	
NACE	TM0172-2001	B+		11, 12
TV/L with 10% Ethanol, Deg F	D5188	See below Table		

TV/L Minimum Table

Class (As depicted in Table 2)	Min TV/L = 20, °F (°C) (with 10 vol% ethanol)
1	129 (54)
2	122 (50)
3	116 (47)
4	107 (42)
5	102 (39)

**BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE VOC CONTROLLED
REFORMULATED REGULAR GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 522, 532, AND 552**

(Page 2 of 2)

This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount.

All parameters must be met after blending with denatured fuel ethanol unless otherwise noted.

NOTES:

1. No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
2. This product may not contain oxygenates such as ethers or alcohols. The use of non-hydrocarbon blending components is prohibited. The maximum limit of MTBE, ETBE, and TAME allowed is 0.3 vol.% maximum for each compound at origin.
3. Refer to test methods published in 40 CFR Chapter 1, Part 80.46.
4. Mercaptan Sulfur waived if fuel is negative by Doctor test.
5. Any gasoline exhibiting an offensive odor and/ or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
6. The use of Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
7. The use of MMT octane enhancing additive is prohibited.
8. The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2 and will apply after blending with 10% Denatured Fuel Ethanol.
9. Oxygen content must meet a minimum of 1.5 wt. % and a maximum of 4.0 wt. % after blending with Denatured Fuel Ethanol.
10. The listed VOC reduction is required at origin. The VOC reduction at delivery will meet EPA requirements.
11. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
12. Only applies before blending with ethanol.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE VOC CONTROLLED
REFORMULATED PREMIUM GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 525, 535 AND 555

(Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color			Undyed	
Gravity, API @ 60°F	D287, D1298, D4052	Report		12
Corrosion, 3 hrs. @ 122°F	D130		1	1
Octane Rating				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	Report		
Index, (R+M)/2		93.0		
Oxygen, wt. %	D5599, GC-OFID	Report		2,3, 9
RVP, psi	D5191		Table 2	3
Benzene, vol. %	D3606		1.30	
Doctor Test OR	D4952		Negative	4
Mercaptan Sulfur, wt. %	D3227		0.002	
Lead Content, gms/gal	D3237 or equiv.		0.01	
Phosphorous, gms/gal	D3231		0.004	
Solvent washed Gum, mg/100ml	D381		4	
Oxidation Stability, minutes	D525	240		
Aromatics, vol. %	GCMS, D5769, D1319		50.0	3
Emissions Performance Reductions				
Grade 535 - VOC Region 2, %	EPA	25.4		10
Grade 525 - VOC Reg 2 Adj (Chicago), %	EPA	23.4		
Grade 555 - VOC Region 1, %	EPA	27.0		
Olefins, vol. %	D1319, D6550		25.0	
Sulfur, wt. %	D2622, D5453, D3120, D7039		.0080	
Odor		Nonoffensive		5
Port Fuel Injector and Intake Valve Detergent Additives				6
Corrosion Inhibitors, Gum Inhibitors and Metal Deactivators - Refer to Table 1				
Distillation -	D86			
50% Evap (T50), Deg F		150	Table 2	
All other Volatility and Distillation – Refer to Table 2				
E200, vol. %	D86	30.0	70.0	
E300, vol. %	D86	70.0	100.0	
MMT				7
Driveability Index	D4814			8
Refer to Table 2				
Silver Strip Corrosion	D7667, D7671		1	
NACE	TM0172-2001	B+		11, 12
TV/L with 10% Ethanol, Deg F	D5188	See below Table		

TV/L Minimum Table

Class (As depicted in Table 2)	Min TV/L = 20, °F (°C) (with 10 vol% ethanol)
1	129 (54)
2	122 (50)
3	116 (47)
4	107 (42)
5	102 (39)

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE VOC CONTROLLED
REFORMULATED PREMIUM GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 525, 535 AND 555

(Page 2 of 2)

This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount.

All parameters must be met after blending with denatured fuel ethanol unless otherwise noted.

NOTES:

1. No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
2. This product may not contain oxygenates such as ethers or alcohols. The use of non-hydrocarbon blending components is prohibited. The di minimis limit of MTBE, ETBE, and TAME allowed is 0.3 vol.% maximum for each compound at origin.
3. Refer to test methods published in 40 CFR Chapter 1, Part 80.46.
4. Mercaptan Sulfur waived if fuel is negative by Doctor test.
5. Any gasoline exhibiting an offensive odor and/ or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
6. The use of Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
7. The use of MMT octane enhancing additive is prohibited.
8. The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2 and will apply after blending with 10% Denatured Fuel Ethanol.
9. Oxygen content must meet a minimum of 1.5 wt. % and a maximum of 4.0 wt. % after blending with Denatured Fuel Ethanol.
10. The listed VOC reduction is required at origin. The VOC reduction at delivery will meet EPA requirements.
11. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
12. Only applies before blending with ethanol.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE NON-VOC CONTROLLED
REFORMULATED REGULAR GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 542, 572 AND 582

(Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color			Undyed	
Gravity, API @ 60°F	D287, D1298, D4052	Report		11
Corrosion, 3 hrs. @ 122°F	D130		1	1
Octane Rating				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	82.0		
Index, (R+M)/2		87.0		
Oxygen, wt. %	D5599, GC-OFID	Report		2,3, 9
RVP, psi	D5191			3
Grade 542 - Non-VOC, psi			15.0	
Grade 582 - Non-VOC, psi			13.5	
Grade 572 - Non-VOC, psi			11.5	
Benzene, vol. %	D3606		1.30	
Doctor Test OR		D4952	Negative	4
Mercaptan Sulfur, wt. %	D3227		0.002	
Lead Content, gms/gal	D3237 or equiv.		0.01	
Phosphorous, gms/gal	D3231		0.004	
Solvent washed Gum, mg/100ml	D381		4	
Oxidation Stability, minutes	D525	240		
Aromatics, vol. %	GCMS, D5769, D1319		50.0	3
Olefins, vol. %	D1319, D6550		25.0	
Sulfur, wt. %	D2622, D5453, D3120, D7039		.0080	
Odor	Nonoffensive			5
Port Fuel Injector and Intake Valve Detergent Additives				6
Corrosion Inhibitors, Gum Inhibitors and Metal Deactivators - Refer to Table 1				
Distillation -	D86			
50% Evap (T50), Deg F		150	Table 2	
All other Volatility and Distillation – Refer to Table 2				
E200, vol. %	D86	30.0	70.0	
E300, vol. %	D86	70.0	100.0	
MMT				7
Driveability Index (DI)	D4814			8
Refer to Table 2				
Silver Strip Corrosion	D7667, D7671		1	
NACE	TM0172-2001	B+		10, 11
TV/L with 10% Ethanol, Deg F	D5188	See below Table		

TV/L Minimum Table

Class (As depicted in Table 2)	Min TV/L = 20, °F (°C) (with 10 vol% ethanol)
1	129 (54)
2	122 (50)
3	116 (47)
4	107 (42)
5	102 (39)

**BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE NON-VOC CONTROLLED
REFORMULATED REGULAR GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 542, 572 AND 582**

(Page 2 of 2)

This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount.

All parameters must be met after blending with denatured fuel ethanol unless otherwise noted.

NOTES:

1. No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
2. This product may not contain oxygenates such as ethers or alcohols. The use of non-hydrocarbon blending components is prohibited. The di minimis limit of MTBE, ETBE, and TAME allowed is 0.3 vol.% maximum for each compound at origin.
3. Refer to test methods published in 40 CFR Chapter 1, Part 80.46.
4. Mercaptan Sulfur waived if fuel is negative by Doctor test.
5. Any gasoline exhibiting an offensive odor and/ or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
6. The use of Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
7. The use of MMT octane enhancing additive is prohibited.
8. The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2 and will apply after blending with 10% Denatured Fuel Ethanol.
9. Oxygen content must meet a minimum of 1.5 wt. % and a maximum of 4.0 wt. % after blending with Denatured Fuel Ethanol.
10. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
11. Only applies before blending with ethanol.

BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE NON-VOC CONTROLLED
REFORMULATED PREMIUM GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 545, 575 AND 585

(Page 1 of 2)

<u>PRODUCT PROPERTY</u>	<u>ASTM TEST METHODS</u>	<u>TEST RESULTS</u>		<u>NOTE</u>
		<u>MINIMUM</u>	<u>MAXIMUM</u>	
Color			Undyed	
Gravity, API @ 60°F	D287, D1298, D4052	Report		11
Corrosion, 3 hrs. @ 122°F	D130		1	1
Octane Rating				
Research Number	D2699, D2885	Report		
Motor Number	D2700, D2885	Report		
Index, (R+M)/2		93.0		
Oxygen, wt. %	D5599, GC-OFID	Report		2,3, 9
RVP, psi	D5191			3
Grade 545 – Non-VOC, psi			15.0	
Grade 585 – Non-VOC, psi			13.5	
Grade 575 – Non-VOC, psi			11.5	
Benzene, vol. %	D3606		1.30	
Doctor Test OR	D4952		Negative	4
Mercaptan Sulfur, wt. %	D3227		0.002	
Lead Content, gms/gal	D3237 or equiv.		0.01	
Phosphorous, gms/gal	D3231		0.004	
Solvent washed Gum, mg/100ml	D381		4	
Oxidation Stability, minutes	D525	240		
Aromatics, vol. %	GCMS, D5769, D1319		50.0	3
Olefins, vol. %	D1319, D6550		25.0	
Sulfur, wt. %	D2622, D5453, D3120, D7039		.0080	
Odor	Nonoffensive			5
Port Fuel Injector and Intake Valve Detergent Additives			6	
Corrosion Inhibitors, Gum Inhibitors and Metal Deactivators - Refer to Table 1				
Distillation -	D86			
50% Evap (T50), Deg F		150	Table 2	
All other Volatility and Distillation – Refer to Table 2				
E200, vol. %	D86	30.0	70.0	
E300, vol. %	D86	70.0	100.0	
MMT				7
Driveability Index (DI)	D4814			8
Refer to Table 2				
Silver Strip Corrosion	D7667, D7671		1	
NACE	TM0172-2001	B+		10, 11
TV/L with 10% Ethanol, Deg F	D5188	See below Table		

TV/L Minimum Table

Class (As depicted in Table 2)	Min TV/L = 20, °F (°C) (with 10 vol% ethanol)
1	129 (54)
2	122 (50)
3	116 (47)
4	107 (42)
5	102 (39)

**BUCKEYE PARTNERS, L.P.
SPECIFICATIONS FOR FUNGIBLE NON-VOC CONTROLLED
REFORMULATED PREMIUM GASOLINE BLENDSTOCK (RBOB) FOR BLENDING
WITH 10% DENATURED FUEL ETHANOL AS DEFINED IN ASTM D4806
GRADE 545, 575 AND 585**

(Page 2 of 2)

This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount.

All parameters must be met after blending with denatured fuel ethanol unless otherwise noted.

NOTES:

1. No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
2. This product may not contain oxygenates such as ethers or alcohols. The use of non-hydrocarbon blending components is prohibited. The di minimis limit of MTBE, ETBE, and TAME allowed is 0.3 vol.% maximum for each compound at origin.
3. Refer to test methods published in 40 CFR Chapter 1, Part 80.46.
4. Mercaptan Sulfur waived if fuel is negative by Doctor test.
5. Any gasoline exhibiting an offensive odor and/ or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
6. The use of Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
7. The use of MMT octane enhancing additive is prohibited.
8. The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2 and will apply after blending with 10% Denatured Fuel Ethanol.
9. Oxygen content must meet a minimum of 1.5 wt. % and a maximum of 4.0 wt. % after blending with Denatured Fuel Ethanol.
10. All products (except aviation grades 152, 153, 155 and 182) must meet a minimum level of corrosion protection, indicated by a minimum rating of B+ as determined by NACE Standard Test Method TM0172-2001 (Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines).
11. Only applies before blending with ethanol.