

Effective Date: 10/1/2015

**Heartland Pipeline Company  
Product Specifications**

**Heartland Pipeline**

<b>Product Name</b>	<b>Destination(s)</b>
Gasoline, Subgrade, 83 octane (87 after 10% ETOH addition)	V Grade
Gasoline, Conventional, 91 octane (no ethanol)	A Grade
Distillate, #2 Diesel Fuel / Fuel Oil, Ultra-Low Sulfur (15 ppm max)	X Grade
Volatility Schedule, Conventional, All Grades	V & A Grades

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Heartland Pipeline Company

Destinations:

Trac66 Code(s):

Product Specifications

V Grade

Heartland Pipeline

Gasoline, Subgrade, 83 octane (87 after 10% ETOH addition)

Property	Test Method	Units	Min	Max	Specific	Note#
Additives	See Note					1
API Gravity (60 Deg F)	D4052 or D1298	API	Report			
Appearance	D4176 Wtr & Part Cont, Proc 1		Pass			
Benzene	D3606 Benz & Tol by GC	Vol%		4.0		
Color, Visual	Visual		Undyed			
Copper Strip Corrosion	D130 Cu Str 3 Hr @ 122 F	Rating		1		
Ethanol Blends	General Note					2
Haze, Colonial	D4176 Wtr & Part Cont, Proc 2	Rating		2		3
Lead (Pb)	D3237 Lead by AA	gPb/gal		0.010		
Mercaptan Sulfur	D3227 Thiol Merc S by Titra	Wt%		0.003		4
Mercaptan Sulfur	D4952 Active S by Doc Tst	Rating	sweet			
NACE Rust test	NACE Rust TM0172-2001	Rating	B+			
Octane, (R+M)/2 - AEA	D2699 & 2700		87.0			5
Octane, (R+M)/2 - CLEAR	D2699 & 2700		83.0			
Octane, Motor- AEA	D2700 Knock Charac by Motor		82.0			5
Octane, Motor- CLEAR	D2700 Knock Charac by Motor		Report			
Octane, Research- AEA	D2699 Knock Char by		Report			5
Octane, Research- CLEAR	D2699 Knock Char by		Report			
Odor	Non-offensive odor		Pass			6
Oxidation Stability	D525 Oxid Stab by Ind Period	minutes	240			
Oxygenates	D5599 Oxy (EPA) by GC OFID	Wt%		.05		7
Phosphorus	D3231 Phosphorus in Gasoline	g/gal		0.003		
Product Description	See Note					8
Referee Methods	See Note					9
Silver Strip Corrosion	D7671	Rating		1		
Solvent Washed Gum	D381 Gum Content by Jet Evap	mg/100 ml		4		
Sulfur	D2622 S by X-ray Fluo Spec	ppm		80		
Volatility & Distillation	D4814 Spec for Auto SI Fuels		see Table			

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Product Specifications

V Grade

## Heartland Pipeline

Gasoline, Subgrade, 83 octane (87 after 10% ETOH addition)

### **Notes:**

1. All additives and their concentrations must be previously approved by the pipeline Regional Fuel Quality Director and must be clearly indicated on the Certificate of Analysis. No intentional addition of MMT, phosphorus, lead, or additives containing other heavy metals is allowed.
2. For summer gasoline with a maximum RVP specification of less than 9.0 psi (as indicated in the Volatility Table) the following language is applicable:
  - (a) Suitable for the special RVP provisions for ethanol blends that contain between 9 and 10 vol% ethanol.
  - (b) The RVP of this blendstock/gasoline does not exceed 9.0 psi.
  - (c) 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.
3. Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1– February 15	45 °F max
4. The Mercaptan Sulfur determination may be waived if the fuel is considered sweet by the Doctor Test described in ASTM D 4952.
5. After Ethanol Addition. Ethanol should be added at 10 Vol%.
6. Any gasoline exhibiting an offensive odor will not be accepted for shipment.
7. These fuels may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
8. This fuel meets or exceeds all the requirements of ASTM D4814 (Unleaded Gasoline). In addition, this fuel is a sub-octane gasoline, meant for blending with ethanol or a higher octane non-oxygenated gasoline in order to meet minimum octane requirements. This product is base gasoline and does not meet the EPA detergent additive requirement for finished gasoline. This product does not meet the requirements for reformulated gasoline (RFG) and may not be used in any RFG covered area.
9. Referee Methods for Gasoline are as follows:  
Vapor / Liquid Ratio, ASTM D5188. (source ASTM D4814); Oxygenates, ASTM D5599 is the EPA approved method, ASTM D4815 may be used if the method is correlated back to ASTM D5599.

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Product Specifications

A Grade

Heartland Pipeline

Gasoline, Conventional, 91 octane (no ethanol)

Property	Test Method	Units	Min	Max	Specific	Note#
Additives	General Note					1
API Gravity (60 Deg F)	D4052 or D1298	API	Report			
Appearance	D4176 Wtr & Part Cont, Proc 1		Pass			
Benzene	D3606 Benz & Tol by GC	Vol%		4.0		
Color, Visual	Visual		Undyed			
Copper Strip Corrosion	D130 Cu Str 3 Hr @ 122 F	Rating		1		
Ethanol Blends	General Note					2
Haze, Colonial	D4176 Wtr & Part Cont, Proc 2	Rating		2		3
Lead (Pb)	D3237 Lead by AA	gPb/gal		0.010		
Mercaptan Sulfur	D3227 Thiol Merc S by Titra	Wt%		0.003		4
Mercaptan Sulfur	D4952 Active S by Doc Tst	Rating	sweet			
NACE Rust test	NACE Rust TM0172-2001	Rating	B+			
Octane, (R+M) / 2	D2699 & 2700		91.0			
Octane, Motor	D2700 Knock Charac by Motor		Report			
Octane, Research	D2699 Knock Char by		Report			
Odor	Non-offensive odor		Pass			5
Oxidation Stability	D525 Oxid Stab by Ind Period	minutes	240			
Oxygenates	D5599 Oxy (EPA) by GC OFID	Wt%		.05		6
Phosphorus	D3231 Phosphorus in Gasoline	g/gal		0.003		
Product Description	See Note					7
Referee Methods	See Note					8
Silver Strip Corrosion	D7671	Rating		1		
Solvent Washed Gum	D381 Gum Content by Jet Evap	mg/100ml		4		
Sulfur	D2622 S by X-ray Fluo Spec	ppm		80		
Volatility & Distillation	D4814 Spec for Auto SI Fuels		see Table			

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Destinations:

Trac66 Code(s):

Product Specifications

A Grade

## Heartland Pipeline

Gasoline, Conventional, 91 octane (no ethanol)

### **Notes:**

1. All additives and their concentrations must be previously approved by the pipeline Regional Fuel Quality Director and must be clearly indicated on the Certificate of Analysis. No intentional addition of MMT, phosphorus, lead, or additives containing other heavy metals is allowed.

2. For summer gasoline with a maximum RVP specification of less than 9.0 psi (as indicated in the Volatility Table) the following language is applicable:

(a) Suitable for the special RVP provisions for ethanol blends that contain between 9 and 10 vol% ethanol.

(b) The RVP of this blendstock/gasoline does not exceed 9.0 psi.

(c) 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.

3. Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30                      55 °F max

October 1– February 15                              45 °F max

4. The Mercaptan Sulfur determination may be waived if the fuel is considered sweet by the Doctor Test described in ASTM D 4952.

5. Any gasoline exhibiting an offensive odor will not be accepted for shipment.

6. These fuels may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.

7. This fuel meets or exceeds all the requirements of ASTM D 4814 (Unleaded Gasoline). This product does not meet EPA additive addition requirements for finished gasoline. This product does not meet the requirements for reformulated gasoline (RFG) and may not be used in any reformulated gasoline covered area.

8. Referee Methods for Gasoline are as follows:

Vapor / Liquid Ratio, ASTM D5188. (source ASTM D4814); Oxygenates, ASTM D5599 is the EPA approved method, ASTM D4815 may be used if the method is correlated back to ASTM D5599.

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Destinations:

Trac66 Code(s):

**Product Specifications**

X Grade

**Heartland Pipeline**

Distillate, #2 Diesel Fuel / Fuel Oil, Ultra-Low Sulfur (15 ppm max)

<b>Property</b>	<b>Test Method</b>	<b>Units</b>	<b>Min</b>	<b>Max</b>	<b>Specific</b>	<b>Note#</b>
Additives	General Note					1
API Gravity (60 Deg F)	D4052 or D1298	API	30.0			
Ash	D482 Ash	Wt%		0.01		
Carbon Res 10% Btms	D524 Ramsbottom Carb Res	Wt%		0.35		
Cetane Ind-2 or Arom	D1319 Hydrocarbon Typ by FIA	Vol%		35.0		2
Cetane Ind-2 or Arom	D976 Cetane Index by 2-var		42			2
Cetane Number or Ind-4	D4737 Cet Ind by 4-var calc A		40.0			3
Cetane Number or Ind-4	D613 Cetane Number by		40			3
Cloud Pt- Summer	D5773 Cloud Pt by Phase Tech	Deg F		20	Apr - Aug	
Cloud Pt- Winter	D5773 Cloud Pt by Phase Tech	Deg F		15	Sep - Mar	
Color, ASTM	D1500 Color (ASTM scale)			2.5		
Color, Visual	Visual		Undyed			
Copper Strip Corrosion	D130 Cu Str 3 Hr @ 122 F	Rating		1		
Dist 10 Vol% Rec	D2887 Sim Dist by GC	Deg F	Report			
Dist 10 Vol% Rec, corr	D86 Dist at Atm Press	Deg F	Report			
Dist 50 Vol% Rec	D2887 Sim Dist by GC	Deg F	Report			
Dist 50 Vol% Rec, corr	D86 Dist at Atm Press	Deg F	Report			
Dist 90 Vol% Rec	D2887 Sim Dist by GC	Deg F	572	672		
Dist 90 Vol% Rec, corr	D86 Dist at Atm Press	Deg F	540	640		
Dist End Pt	D2887 Sim Dist by GC	Deg F	Report			
Dist End Pt, corr	D86 Dist at Atm Press	Deg F	Report			
Dist IBP	D2887 Sim Dist by GC	Deg F	Report			
Dist IBP, corr	D86 Dist at Atm Press	Deg F	Report			
Flash Pt	D93 PMCC Flash Pt	Deg F	135			
Haze Rating @ 77F	D4176 Wtr & Part Cont, Proc 2	Rating		2		4
NACE Rust test	NACE Rust TM0172-2001	Rating	B+			
Pour Pt- Summer	D5949 Pour Pt by Phase Tech	Deg F		10	Apr - Aug	
Pour Pt- Winter	D5949 Pour Pt by Phase Tech	Deg F		0	Sep - Mar	
Product Description	See Note					5
Referee Methods	See Note					6
Referee Methods	See Note					7
Sulfur	D2622 S by X-ray Fluo Spec	ppm		11		
Thermal Stability- 90 min	D6468 Stability by Reflect	% Refl	75		W test unit	
Thermal Stability- 90 min	D6468 Stability by Reflect	% Refl	82		Y test unit	
Viscosity @ 104 F	D445 Kinematic Viscosity	cSt	1.9	3.4		
Water & Sed, total	D2709 Water & Sed by Centr	Vol%		0.05		

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Heartland Pipeline Company

Destinations:

Trac66 Code(s):

Product Specifications

X Grade

## Heartland Pipeline

Distillate, #2 Diesel Fuel / Fuel Oil, Ultra-Low Sulfur (15 ppm max)

### **Notes:**

1. All additives and their concentrations must be previously approved by the pipeline Regional Fuel Quality Director and must be clearly indicated on the Certificate of Analysis.
2. Either the Cetane Index by 2-variables minimum or the Aromatics maximum must be met (see ASTM D975 Table 1 notes for method version)
3. Where cetane number by Test Method D 613 is not available, Test Method D 4737 can be used as an approximation. (ASTM D975 Table 1 Notes)
4. Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.
5. This fuel meets or exceeds all the requirements of ASTM D975 (Ultra Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil) and ASTM D396 (Grade No. 2 Low Sulfur Fuel Oil), with the possible exception of the lubricity/conductivity requirements in ASTM D975. Additives or further blending may be utilized at downstream locations to meet these requirements.
6. ASTM Referee Methods for #2 Diesel Fuel, 15 ppm Sulfur, are as follows:  
Cloud Pt, ASTM D2500; Flash Point, ASTM D93; Sulfur, ASTM D5453. (source ASTM D975)
7. ASTM Referee Methods for #2 Fuel Oil, 500 ppm Sulfur, are as follows:  
Density, ASTM D1298; Distillation, ASTM D86; Flash Point, ASTM D93; Pour Point, ASTM D97; Sulfur, ASTM D2622. (source ASTM D396)

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Product Specifications

V & A Grades

Heartland Pipeline

Volatility Schedule, Conventional, All Grades

Month(s)	Class	Pipeline Grade(s)	Clear	E10	E10	Clear	Drive Index	Distillation Requirements, °F						Dist Resid max, %
			RVP max, psi	RVP max, psi	V/L Test Temp min, °F	V/L Test Temp min, °F		10% max	E10 50% min	Clear 50% min	50% max	90% max	End Pt max	
Jan	E-5	V, A	15.0*	16.0	102	105*	1200	122	150	170*	230	365	430	2
Feb	E-5	V, A	15.0*	16.0	102	105*	1200	122	150	170*	230	365	430	2
Mar	E-5	V, A	15.0*	16.0	102	105*	1200	122	150	170*	230	365	430	2
Mar	D-4	V, A	13.5*	14.5	107	116*	1220	131	150	170*	235	365	430	2
Apr	D-4	V, A	13.5*	14.5	107	116*	1220	131	150	170*	235	365	430	2
Apr	A-3	V, A	9.0*	10.0	116	124*	1250	158	150	170*	250	374	430	2
May	A-3	V, A	9.0*	10.0	116	124*	1250	158	150	170*	250	374	430	2
Jun	A-2	V, A	9.0*	10.0	122	133*	1250	158	150	170*	250	374	430	2
Jul	A-2	V, A	9.0*	10.0	122	133*	1250	158	150	170*	250	374	430	2
Aug	A-2	V, A	9.0*	10.0	122	133*	1250	158	150	170*	250	374	430	2
Sep 1 - 15	A-2	V, A	9.0*	10.0	122	133*	1250	158	150	170*	250	374	430	2
Sep 16 - 30	A-2	V, A	9.0*	10.0	122	133*	1250	158	150	170*	250	374	430	2
Sep 16 - 30	B-2	V, A	10.0*	11.0	122	133*	1240	149	150	170*	245	374	430	2
Oct	B-2	V, A	10.0*	11.0	122	133*	1240	149	150	170*	245	374	430	2
Oct	C-3	V, A	11.5*	12.5	116	124*	1230	140	150	170*	240	365	430	2
Nov	C-3	V, A	11.5*	12.5	116	124*	1230	140	150	170*	240	365	430	2
Nov	D-4	V, A	13.5*	14.5	107	116*	1220	131	150	170*	235	365	430	2
Dec	D-4	V, A	13.5*	14.5	107	116*	1220	131	150	170*	235	365	430	2
Dec	E-5	V, A	15.0*	16.0	102	105*	1200	122	150	170*	230	365	430	2

Vapor pressure and T50 minimum limits marked with an \* apply to the fuel without ethanol. Unmarked vapor pressure and T50 minimum limits apply to the fuel with 10 vol% ethanol. Other limits can be used either for fuel with or without ethanol, depending on whether the distributed fuel will or will not contain ethanol.

Seller's choice for months with multiple classes. During transition months, certain volatility classes may be required prior to the class being listed in this table in order to turn over downstream tanks. In this case, find the next associated volatility class in the table based on the lowest RVP class that the product meets and use the associated volatility properties (for example, a 9 lb RVP shipped in March would be an A-3 class instead of a D-4 class).

Test Methods: (latest version unless otherwise indicated)

Distillation: ASTM D86, corrected to 760 mm Hg;

Driveability Index: ASTM D4814;

V/L: ASTM D5188, or the estimate method using Appendix X2 of ASTM D4814;

Vapor Pressure: ASTM D5191-01. For conventional gasoline that meets a summer RVP specification of 9.0 psi or less and which is intended for sale in the summer, EPA requires the use of the EPA equation and also requires that batch reporting of RVP be to 2 decimal places (example; 8.97 psi).