1300 South 2nd Street
P.O. Box 10
Pekin, IL 61555-0010
Ph# 309-347-9200

"Providing clean, renewable energy for the world."

AVENTINE RENEWABLE ENERGY

FUEL-GRADE ETHANOL SPECIFICATIONS (DENATURED)

Aventine Renewable Energy's marketed Fuel-Grade Ethanol meets or exceeds all industry standards, including ASTM D.4806 specifications and Magellan Pipeline specifications for E-Grade Denatured Fuel Ethanol or customers specifications as required.

TEST	Specification	METHOD OF TEST
Apparent Proof - 60°F	Report	ASTM D-4052 / Conversion Table
OR		
Specific Gravity, 60/60°F	Report	ASTM D-4052
Water, Mass Percent Volume %	1.0 maximum 1.26 maximum	ASTM E-203
Ethanol Content, Volume Percent	92.1 minimum	ASTM D-5501
Methanol, (vol. %)	0.50 maximum	ASTM D-5501
Sulfur, Mass Percent	0.0010 maximum	ASTM D-5453
Benzene, (vol. %)	0.06 maximum	ASTM D-3606
Olefins, (vol. %)	0.50 maximum	ASTM D-1319
Aromatics, (vol. %)	1.70 maximum	ASTM D-1319
Chloride mg/l	10 maximum	ASTM D-7328-07 ASTM D-7319-07
Copper Content, mg/kg	0.08 maximum	ASTM D-1688, Meth.D Modified Note (2)
Acidity (as acetic acid CH_3C00H), mass %	0.0070 maximum 0.0042 maximum (Shipments to Canada)	ASTM D-1613
Appearance	Clear and Bright, visibly free of suspended and/or settled contaminants.	ASTM D-4806
Hydrocarbon Denaturant vol%	50 maximum 1.96 minimum	ASTM D-4806
pHe	6.5 minimum 9.0 maximum	ASTM D-6423
Sulfate-mg/kg	4.0 maximum	ASTM D-7318-07 ASTM D-7319-07 ASTM D-7328-07
Solvent washed gum	5.0 mg/100 ml max	ASTM D-381

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(NOTES)

Note 1:The modification of Test Method D-1688, Procedure D, consists of mixing reagent grade ethanol (which may be denatured according to BATF Formula 3A or 3O) in place of water as the solvent or diluent for the preparation of reagents and standard solutions. However, this must not be done to prepare the stock copper solution described in 39.1 of D-1688. Because a violent reaction may occur between the acid and the ethanol, use water as specified in the acid solution part of the procedure to prepare the stock copper solution. Use ethanol for the rinse and final dilution only.

Note 2: The only denaturants shall be natural gasoline, gasoline components, or unleaded gasoline at a minimum concentration of 2 parts by volume per 100 parts by volume. Hydrocarbons, with an end boiling point higher than 437°F as determined by ASTM Method D-86, shall not be used.

Note 3: All fuel ethanol will contain a minimum of one of the following corrosion inhibitors:

a) 20 pounds per 1,000 barrels of Octel Starreon DCI-11
b) 20 pounds per 1,000 barrels of Petrolite Tolad 3222
c) 13 pounds per 1,000 barrels of Petrolite Tolad 3224
d) 30 pounds per 1,000 barrels of Nalco 5403
e) 20 pounds per 1,000 barrels of Endcor FE-9730 (1)
f) 20 pounds per 1,000 barrels of MidContinental MCC5011E
g) 27 pounds per 1,000 barrels of MidContinental MCC5011EW
h) 13 pounds per 1,000 barrels of US Water Services Corrpro 654
i) 13 pounds per 1,000 barrels of US Water Services Corrpro 656
j) 15 pounds per 1,000 barrels of Nalco EC 5624A
k) 10 pounds per 1,000 barrels of Aftron Chemcial Bio Tec 9880
l) 16 pounds per 1,000 barrels of Lubrizol LZ 541

(1) Formerly Betz CAN 13