

PURFUELS

Technical data sheet

Ethanol-free Gasoline with Isobutanol On Road

For Reformulated and Conventional Regions, EPA approved for on-road use.

DESCRIPTION

Purfuels ethanol-free gasolines are made to EPA specifications replacing ethanol with Isobutanol. These gasolines can be used in Reformulated Gasoline Areas (RFG) and are approved for use in environmentally sensitive areas like national parks. Purfuels ethanol-free gasolines resist moisture and eliminate ethanol-related issues. The gasolines are well-suited for venter fuel systems like generators, motorcycles, snowmobiles, small engine equipment, boat engines and emergency equipment. Purfuels ethanol-free gasolines produces more power due to the use of denser oxygenate and evaporative emissions are reduced due to the lower vapor pressure of Purfuels ethanol-free gasolines. Underwriter Laboratories (UL) has approved the generic use of up to 16% Isobutanol in UL 87A pumps by any manufacturer meeting ASTM specifications.

HEALTH AND SAFETY

This is a flammable liquid and must be kept away from open flames and ignition sources. Do not ingest or breathe the fuel or its vapors. Wash away any fuel upon contact. Have adequate venting of vapor. Wear eye protection. Empty containers should be properly marked and disposed. See the Safety Data Sheet for more information.

TYPICAL CHARACTERISTICS

Test	Summer Specs	Winter Specs
RVP, psi	7.8 Max	12.7 Max
Oxygen %	2.7% Min	2.7% Min
Color	Clear	Clear
R+M/2	91-93	91-93
T10, 10% Max F	158	122
T50, 50% Max F	250	230
T90, 90% Max	374	365

Detergent: Innospec DMA651 @ 24 ptb

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MARKETING OPPORTUNITY

PUT PURFUELS PREMIUM AT YOUR DISPENSERS

ASK ABOUT CONVERTING YOUR E85 OR BLENDER DISPENSERS



MARINE-170331

PRODUCT AVAILABILITY



5-Gallon



54-Gallon



275-Gallon



Bulk

PURFUELS: DESIGNED FOR POWER UNITS SEEKING ETHANOL FREE PERFORMANCE



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OTHER INFORMATION

Energy Content Comparison:

1. Ethanol: Energy content of about 76,000 BTU per gallon, which is about 66% of the energy content of gasoline (114,000 BTU/gallon).
2. Isobutanol: Energy content of around 98,000 BTU per gallon, is closer to gasoline, retaining about 85% of gasoline's energy content. This higher energy density of Isobutanol makes it more advantageous from a fuel economy perspective when compared to ethanol.

CO2 Emissions Reduction:

Several documents show that blending Isobutanol with gasoline can reduce CO2 emissions, often due to Isobutanol's superior combustion characteristics, higher energy content, and lower evaporative emissions compared to ethanol. These documents include:

1. Studies from the U.S. Department of Energy (DOE) show that Isobutanol can be used in blends with gasoline and demonstrate improved fuel efficiency and lower greenhouse gas emissions compared to ethanol-gasoline blends. DOE studies often cite that Isobutanol-gasoline blends can reduce carbon dioxide (CO2) emissions, although the exact percentage of reduction can vary depending on the blend ratio.
2. Gevo, Inc., a leading producer of Isobutanol, provides documentation on how Isobutanol-blended fuels achieve up to a 30% reduction in CO2 emissions compared to gasoline. Their sustainability reports often highlight how Isobutanol's lower carbon footprint and better energy performance can contribute to meeting sustainability and decarbonization goals.
3. Scientific Research Papers: Several peer-reviewed studies have analyzed Isobutanol's performance in combustion engines, showing improvements in CO2 emissions compared to ethanol blends. A 30% reduction in CO2 emissions from Isobutanol blends is often cited as a possibility depending on the specific engine type and operational conditions.

Sustainability Advantages:

Isobutanol, a more sustainable fuel additive because:

1. It produces fewer evaporative emissions, contributing to improved air quality.
2. It has a lower oxygen content than ethanol, leading to more efficient fuel combustion.
3. Its production from biomass or renewable sources aligns with circular economy goals and helps to reduce lifecycle greenhouse gas emissions.

For further reference, detailed technical documentation can typically be obtained from:

1. DOE National Renewable Energy Laboratory (NREL) reports.
2. EPA's renewable fuel standards (RFS) program documentation on biofuels.
3. Scientific literature databases (e.g., ScienceDirect, Wiley Online Library).
4. Gevo, Inc. sustainability and technical reports, which often provide detailed life cycle analysis (LCA) of Isobutanol's carbon reduction potential.

These sources provide both the energy content comparison and detailed sustainability metrics that could support your need to demonstrate Isobutanol as a lower-carbon alternative to ethanol.