CATERPILLAR®

Gas Engine Rating Pro
Fuel Analysis

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Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	95.6300	95.6300
Ethane	C2H6	2.1000	2.1000
Propane	C3H8	1.4640	1.4640
Isobutane	iso-C4H10	0.0870	0.0870
Norbutane	nor-C4H10	0.2300	0.2300
Isopentane	iso-C5H12	0.0860	0.0860
Norpentane	nor-C5H12	0.0590	0.0590
Hexane	C6H14	0.0610	0.0610
Heptane	C7H16	0.1060	0.1060
Nitrogen	N2	0.0000	0.0000
Carbon Dioxide	CO2	0.0000	0.0000
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.1770	0.1770
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Addax PVT 2020 scrub
Unit of Measure:	Metric

Calculated Fuel Properties

Caterpillar Methane Number:	78.0
Lower Heating Value (MJ/Nm3):	37.93
Higher Heating Value (MJ/Nm3):	42.05
WOBBE Index (MJ/Nm3):	49.34
THC: Free Inert Ratio:	Not Applicable
Total % Inerts (% N2, CO2, He):	0%
RPC (%) (To 35.64 MJ/Nm3 Fuel):	100%
Compressibility Factor:	0.998
Stoich A/F Ratio (Vol/Vol):	10.05
Stoich A/F Ratio (Mass/Mass):	17.01
Specific Gravity (Relative to Air):	0.591
Fuel Specific Heat Ratio (K):	1.308

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for MJ/Nm3 calculations are at 0C and 101 kPa.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.