Chemical Composition of Natural Gas

Natural gas is a naturally occurring gas mixture, consisting mainly of methane. The gas supplied to Union Gas comes from western Canada, the United States and Ontario producers. While the gas from these sources has a similar analysis, it is not entirely the same. The table below outlines the typical components of natural gas on the Union Gas system and the typical ranges for these values (allowing for the different sources).

Note that there is no guarantee of the following composition at your location or as an overall system average. Since the different gas supplies enter the Union Gas system at different locations, the exact composition at any site will vary among the different regions and over time. The system average heating value will depend on the mix of gas supplies (which is increasingly controlled by our customers), and therefore can vary from the typical value listed below.

Component	Typical Analysis (mole %)	Range (mole %)
Methane	93.9	87.0 - 97.0
Ethane	4.2	1.5 - 9.0
Propane	0.3	0.1 - 1.5
iso - Butane	0.03	0.01 - 0.3
normal - Butane	0.03	0.01 - 0.3
iso - Pentane	0.01	trace - 0.04
normal - Pentane	0.01	trace - 0.04
Hexanes plus	0.01	trace - 0.06
Nitrogen	1.0	0.2 - 5.5
Carbon Dioxide	0.5	0.05 - 1.0
Oxygen	0.01	trace - 0.1
Hydrogen	trace	trace - 0.02

Specific Gravity	0.59	0.57 - 0.62
Gross Heating Value (MJ/m^3), dry basis *	38.7	36.0 - 40.2
Wobbe Number (MJ/m^3)	50.4	47.5 - 51.5

* The gross heating value is the total heat obtained by complete combustion at constant pressure of a unit volume of gas in air, including the heat released by condensing the water vapour in the combustion products (gas, air, and combustion products taken at standard temperature and pressure).

Sulphur:

In the Union Gas system, the typical sulphur content is 5.5 mg/m^3. This includes the 4.9 mg/m^3 of sulphur in the odourant (mercaptan) added to gas for safety reasons.

Water:

The water vapour content of natural gas in the Union Gas system is less than 65 mg/m^3, and is typically 16 to 32 mg/m^3.

Typical Combustion Properties of Natural Gas

Note that there is no guarantee that the combustion properties at your location will be exactly as shown. The properties shown are an overall average on the Union Gas system.

- Ignition Point: 564 ^{o}C *
- Flammability Limits: 4% - 15% (volume % in air) *
- Theoretical Flame Temperature (stoichiometric air/fuel ratio): 1953 ^{o}C *
- Maximum Flame Velocity: 0.36 m/s *

* Information provided is from the Ortech Report No. 26392, Combustion Property Calculations for a typical Union Gas Composition, 2017.