

LNG Operational Information

WHAT IS LNG?

- When natural gas is cooled to a temperature of approximately - 160°C, at atmospheric pressure, it condenses to a liquid called liquefied natural gas (LNG).
- 600 cubic meters of natural gas condense to approximately ONE cubic meter of LNG.
- LNG weighs approximately 45% of an equal volume of water.
- LNG is odourless, colourless, non-corrosive and non-toxic.
- When vaporised it burns only in concentrations of 5% to 15% when mixed with air.
- Neither LNG, nor its vapour, can explode in an unconfined environment.

COMPOSITION

The prime component is methane, usually > 95 %, the precise composition varies slightly and may be dependant on the composition of the precondensed gas.

Production

Natural gas is composed primarily of methane, but may also contain ethane, propane and heavier hydrocarbons. Small quantities of nitrogen, carbon dioxide, sulphur compounds and water may also be found in "pipeline" natural gas.

The liquefaction process removes the carbon dioxide, sulphur compounds, and water.



HOW IS IT STORED?

LNG must be maintained cold to remain a liquid, independent of pressure.



LNG tanks are always of double-wall construction with extremely efficient insulation between the walls. Large tanks generally have a low aspect ratio (height to width) and are cylindrical in design with a domed roof. Storage pressures in these tanks are very low, less than 120mb. Smaller quantities tend to be stored in vacuum-jacketed, pressure vessels. These tanks may operate at pressures from a few millibars to 18 barg.

HOW IS IT KEPT COLD?

The insulation alone, as efficient as it is, will not prevent the ingress of heat. LNG is stored as a "boiling cryogen," that is, it is a very cold liquid at its boiling point for the pressure at which it is being stored. LNG will stay at near constant temperature if kept at constant pressure. This phenomenon is called "autorefrigeration". As long as the LNG vapour (boil off) is allowed to leave the tank, the temperature will remain constant.



If the vapour is not drawn off, then the pressure and temperature inside the vessel will rise.

HOW SAFE IS LNG?



LNG is a form of energy and must be respected as such. LNG Storage insists on very high standards for its operations, to ensure that safe production, storage, vaporisation and transportation is maintained.

LNG AS A VEHICLE FUEL

LNG is already used as a vehicle fuel in the UK. As a vehicle fuel, LNG is burned in the gaseous form and the benefits of burning natural gas (or vapourised LNG), when compared to petrol or diesel, are well documented.



Natural gas (and vapourised LNG), when burned as a fuel, produce significantly less of the emissions addressed in the 1990 Clean Air Act Amendments of the Environmental Protection Act (EPA90). Those emissions specifically being particulate matter (PM), carbon monoxide (CO), nitrogen compounds (NOx) and volatile hydrocarbons (VHC's).

WHAT IS CNG?



Compressed natural gas (CNG) is natural gas pressurised and stored in bottle-like containers at pressures up to 250 bar. Typically, it is same composition of the local "pipeline" gas. CNG and LNG are both delivered to the engines as low pressure vapour. CNG is often misrepresented as the only form natural gas that can be used as vehicle fuel.

WHAT IS LPG?

Liquid petroleum gas (LPG, and sometimes called propane) is often confused with LNG and vice versa. They are not the same and the differences are significant. LPG is composed primarily of propane (upwards to 95%) and smaller quantities of butane. LPG can be stored as a liquid in tanks by applying pressure alone. LPG is the "bottled gas" often found under BBQ grills. LPG has been used as fuel in light duty vehicles for many years. Many petrol stations in Europe have LPG pumps.

