

# EFFICIENCY OF METHANE GAS FUEL FOR CARS

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## Abstract:

This article contains information about the technology, safety issues, production processes of developing methane gas cylinders for automobiles. Similarly, the properties of methane gas have also been highlighted in terms of its use.

## Keywords

CNG, gas balloon, 34CrMo4, certification, carbon dioxide, nitric oxide.

## Introduction

In our daily lives, people use private or public transportation to get themselves close to their long distances. It is clear from this that cars run on different fuels and electricity. When cars use gasoline and diesel fuels, they emit a number of harmful gases into the environment. These gases are released into the air and cause serious damage to global climate change and human health. The harmful substances emitted from gasoline and diesel fuels are:

- a) Carbon dioxide: This gas is the biggest contributor to climate change. This is because combustion of petrol and diesel fuels releases CO<sub>2</sub>, which accumulates in the ozone layer, traps heat and causes global warming.
- b) Nitrogen oxides: Diesel engines emit more nitrogen oxides than gasoline engines. These gases can react in the air, causing smog and oxygen deficiency (damage to the ozone layer). Nitric oxides exacerbate respiratory problems for humans, especially diseases such as asthma and bronchitis. The exhaust gases from gasoline and diesel fuels have negative effects on the environment and human health. To address this problem, it is necessary to switch to less harmful means, improve fuel efficiency, and develop other environmentally friendly technologies.

## The Importance of Using Methane Gas in Cars

Natural gas (CNG) is the most widely used energy source used as an alternative fuel in automobiles. The following advantages of methane gas make it ideal for use in automobiles:

Methane gas combustion emits less carbon dioxide (CO<sub>2</sub>) and other harmful substances than gasoline or diesel combustion. It helps to alleviate the problems of environmental conservation. The price of methane gas is lower compared to gasoline and diesel, which allows car owners to reduce costs. At present, the world's natural gas reserves amount to 175 billion. See also[edit] Gaseous fuels are composed of flammable (CO, N<sub>2</sub>, CH<sub>4</sub>,

CmHn) and non-flammable (N<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub>) gases and non-abundant water vapor (H<sub>2</sub>O). The amount of heat released during the complete combustion of a 1m<sup>3</sup> gaseous fuel is called the heat of combustion of the fuel. The combustion heat of the fuel is high Q<sub>q</sub> (kJ/kg) and low Q<sub>q</sub> (kJ/kg). Low combustion heat (kJ/Nm<sup>3</sup>) of gaseous fuel:

$Q_q = 108H_2 + 126CO + 234H_2S + 358CH_4 + 591C_2H_4 + 638C_2H_6 + 7860C_3H_6 + 913C_5H_8 + 1135C_4H_8 + 1187C_4H_{10} + 1461C_5H_{12} + 1403C_6H_6$

Here: H<sub>2</sub>, CO, H<sub>2</sub>C, CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub> and others are the volumetric amount of gases that make up gaseous fuels. Natural gas is cheaper and more sustainable to produce and deliver than gasoline and diesel.

Methane gas cylinders are made of the following materials:

Steel: Steel cylinders are highly pressure resistant to ensure long-term (i.e. 15 years) performance. They are made of non-choke steel pipes branded 34CrMo4. Their thickness is 7.7mm with a diameter of 356, and 8.8mm with a diameter of 406. Currently, methane gas cylinders from 30 liters to 150 liters are produced in our country.

Pressure and volume: Methane gas cylinders typically withstand pressures of at least 150 bar to 200 bar. The size of the balloons is selected according to the needs of the vehicle. As an example, for passenger cars produced at most 65 and 90-liter methane balloons.

Process of Development of Methane Gas Cylinders for Automotive

The production process of methane gas balloons involves a number of technological stages. The main stages are:

### Material tanlash

A lot of attention is paid to the quality of the aforementioned steel grade to ensure that the methane gas is stored at high pressures. Each of these steels has its advantages and disadvantages.

### Development process

Quality control: Balloons are tested by ultrasonic sound before production. This process goes into ensuring safety, durability and long-term performance of products.

Giving shape: A seamless steel pipe is cut using plasma of the desired size for a gas balloon. Then it is bent by heating the bottom (at 1170 degrees) and the top (at 1350 degrees). Then I tabbed the balloon (at 900 degrees) in a topping oven. After cooling, the thread unfolds. At this stage, cracks appear on the friction of some balloons. This leads to the unsuitable condition of the product. If this gas balloon goes on sale, it will end someone's life. Causes of the appearance of cracks During bending, the worker does not bring or miss the bending point to the specified temperature. Another reason is that the oxygen does not turn on when indicated. That is, the worker does not pay attention to the task assigned to him. Therefore, an extremely high degree of responsibility and attention is required in the process of work. After the rezba is opened, the gas balloons are tested.

Reinforcement and testing: Balloons are subjected to high pressure air (20 MPa) and water (30 MPa) quality control and testing. Those that have successfully passed the test will be

sent for digitization. Then the inner and outer surfaces are cleaned and go to the process of cracking. The thickness of the paint is checked by laboratory staff and allowed to be packed. Certification: Each balloon is issued a certificate to ensure it meets safety requirements. It contains mainly the balloon liters, kilograms and serial numbers.

The production of methane gas cylinders for automobiles is an important part of the development of environmentally friendly and efficient fuel systems. Advantages of methane gas: cheaper than fossil fuels and less harmful to the environment. The alternative has less of a risk to the climate. Improvements in balloon production processes, safety, materials and technologies with innovative approaches will allow to further improve the efficiency of this system in the future.

### **Conclusion**

One of the most dangerous factors globally right now is environmental pollution. This puts lives at risk. Therefore, we should try to preserve the environment as much as possible. It is important that we move away from fuels that are less harmful to nature. As mentioned above in this matter, we need to use compressed gas, which emits less toxic gas than gasoline, diesel. Methane gas balloons are long-lasting, as long as they are made from high-quality steel pipes.

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