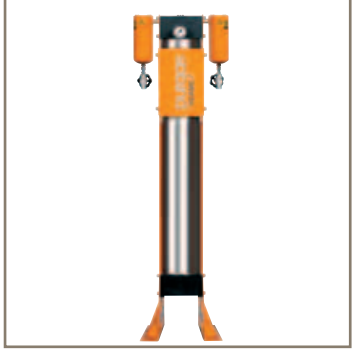

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Natural Gas Filtration and Drying Solutions

for NGV Fuelling Applications

Parker Zander

ENGINEERING YOUR SUCCESS.

CNG Contamination Problems

NGV Refuelling Applications

Compressed Natural Gas (CNG) is a leading alternative to other traditional fuels used in the automotive industry. Natural Gas Vehicle (NGV) types range from large trucks, buses and commercial vehicles down to passenger cars, taxis, fork-lifts and motorized tricycles. The use of CNG as a vehicle fuel contributes to the reduction of CO_2, nitrous-oxide and particulate emissions and many governments financially support the use of this energy source due to these environmental benefits and to achieve goals for emission reductions.

In NGV fuelling stations, Natural Gas is taken from a pipeline and compressed to pressures ranging from 150 barg up to 350 barg. The resultant CNG is stored in purpose built tanks and, on demand, is piped to a gas dispenser where it is used to refuel NGV's.

CNG can also be produced by upgrading biogas to gas pipeline quality standard. The upgraded biogas is known as biomethane which can be converted to CNG by compression in the same manner as for Natural Gas.

The Problem

CNG is prone to the same types of contamination that are present in traditional fuels – solids that collect during handling, water that condenses in storage and vehicle fuel tanks and lube oils that carry over into the CNG stream. During its transport to the dispenser the CNG will also pick up contaminants from the delivery system.

These problems lead to:

- Compressor fouling
- Vehicle fuel system breakdown
- Liquids in storage tanks and vehicle fuel tanks which cause corrosion
- Gas dispenser breakdown
- Formation of hydrates causing blockages in valves, orifices, nozzles etc.

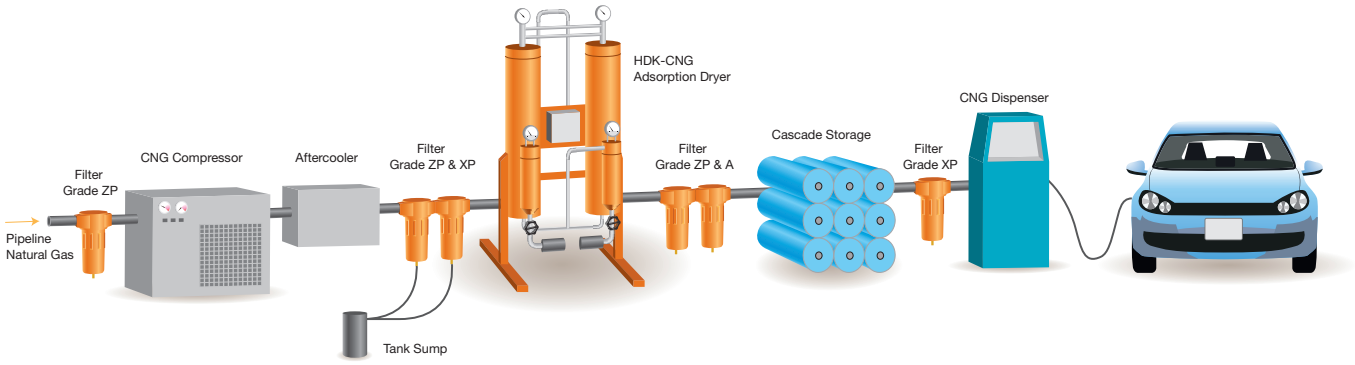
CNG Cylinder Corrosion

ISO 15403:2000(E), Paragraph 5.1
The Single Most Important Safety Factor for CNG

"The single most important safety requirement of compressed natural gas (CNG) fuel is very low water dew-point temperature to preclude the formation of liquid water at any time. Liquid water is the precursor to the formation of corrosive compounds through combination with components in natural gas, namely carbon dioxide and hydrogen sulfide.
The combination of corrosive agents, and the pressure cycling, caused by fuel consumption and subsequent refilling of the fuel storage container, can result in crack growth in metals and ultimately damage and failure. Also, liquid water itself can be detrimental as it may cause blockages, both liquid and solid, in the fuel system. Thus, the water dew-point of the fuel gas at the fuelling station outlet shall be sufficiently below the lowest ambient temperature in which the fuelling station and vehicles will operate."

Parker solutions for clean dry compressed natural gas

Typical CNG fuel station layout



CNG Filtration

Installing a low pressure particulate filter before the CNG compressor will remove pipe scale to prevent damage to the compressor. After compression, the installation of a coalescing filter will eliminate oil and water aerosols protecting downstream components. For extra protection, the addition of a high efficiency coalescer installed at the CNG dispenser will protect sensitive metering equipment and provide further protection from oil entering vehicle fuel tanks.

- Wide range of filtration grades
- Pressures 16/50/100-350 barg
- Threaded & Flanged connections
- Housings in Aluminium, Steel and Stainless Steel
- Approved for fluid group 1 gases
- Accreditted to PED/CE
- Optional ATEX compliance for zone 2 or zone 1 applications

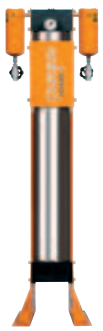
CNG Dryers

Installing an adsorption dryer in the NGV station will ensure the gas dewpoint is sufficiently low to prevent moisture condensation as recommended in the ISO 15403:2000(E) standard.

STV

Single Tower, Suction-Side Adsorption Dryer

Wide Range of Gas Flow Rates, recommended for low throughput fuelling applications



HDAM/E

Single Tower, Discharge Side Adsorption Dryer

Low to Medium Gas Flow Rates, recommended for low throughput fuelling duties

W-EKT

Dual Tower, Suction-Side Regenerative Adsorption Dryer

Medium to High Gas Flow Rates, recommended for medium to high throughput fuelling duties

HDK-CNG

Dual Tower, Discharge Side, Regenerative Adsorption Dryer

Low to Medium Gas Flow Rates, recommended for medium to high throughput fuelling duties

Granzow AB - svensk tryckluftspartner

Granzow AB är idag en av de tre största aktörerna inom tryckluftsteknik på den svenska marknaden. Vår position är understödd av några av de marknadsledande tillverkarna av kompressorer och luftbehandlingsutrustning.

SP Certifierad ISO 14001

ISO 14001

Granzow service är certifierad enligt ISO 14001 vilket medför att kvalitets- och miljötänkande är naturliga faktorer i vårt arbete. Vi ser som en av våra uppgifter att hålla våra kunders tryckluftsproduktion igång och samtidigt utföra uppdraget med utgångspunkt från högt ställda kvalitets- och miljökrav.

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