



## GAS ANALYSIS | CHEMICAL ENGINEERING ANALYSIS OF OPERATING MATERIALS

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Consultancy Services | Analysis | Evaluation  
Gas Quality Competence Centre

Open Grid Europe GmbH  
Kallenbergstraße 5 | 45141 Essen  
T +49 201 3642-0 | F +49 201 3642-13900  
info@open-grid-europe.com  
www.open-grid-europe.com

Altenessen Gas Quality Competence Centre:  
Service No. T +49 201 3642-18811  
gasquality@open-grid-europe.com





Our service: natural gas expertise

## Gas Quality Competence Centre

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**Our Gas Quality Competence Centre answers questions on chemical analysis and process engineering that are connected with the transport and use of natural gas.**

In a natural gas industry that is developing increasingly rapidly, it is crucially important to have exact information on the natural gas composition as well as the chemical and physical parameters connected with natural gas transmission and utilisation. Regardless of whether the task is to monitor and safeguard the product quality, the operational readiness of the necessary materials, chemical and process engineering matters or environmental aspects: you can rely on our know-how.

The services offered by our Competence Centre are based on many years of experience gained in the operation of our transmission system and cooperation with customers from many different segments of the energy sector and other industries.

We use high-performance methods and measuring procedures for the analysis of gases and accompanying substances in the gas, for quality control of operating media and for determining the process engineering and physical data of gas transmission systems. We are also able to develop individual solution concepts that contribute to optimising technical processes and enhancing efficiency. Our range of services is aimed at all companies who extract, process, transport, store and utilise natural gas – companies from the energy sector and other industries as well as plant engineering companies, inspection bodies, research institutions and the authorities.

Our Gas Quality Competence Centre is certified to DIN EN ISO 9001. The test laboratory for natural gas analysis is accredited to DIN EN ISO/IEC 17025.

### Open Grid Europe | The Gas Wheel

Open Grid Europe is one of the leading transmission system operators in Europe. We provide secure gas transmission in line with our customers' needs and are a partner you can rely on for all grid-related services – 24 hours a day, 7 days a week.

### The facts

Our customers: more than 450 national and European network operators, municipal utilities, industrial customers and gas traders | Our employees: around 1,450 throughout Germany | Our transmission system: about 12,000 km long, 30 compressor stations, 100 machine units. 17 border crossing points. Around 1,100 exit points, 632 bn kWh of exit quantities in 2017. Around 142 million kW of peak load in 2017.



### Your contact

Dr Tobias van Almsick | T +49 201 3642-18536  
tobias.vanalmsick@open-grid-europe.com



left  
Sampler for a gas chromatograph

right  
Injection of sample material

Exact analysis: accredited to DIN EN ISO/IEC 17025

# Gas chromatography

**Gas analyses using gas chromatography are among the key tasks of the Gas Quality Competence Centre.**

Exact knowledge of the gas composition is extremely important to ensure optimum utilisation of the natural gas. Particularly the combustion properties and material-specific data that can be derived from an accurate gas analysis provide fundamental information for many technical processes. In addition, a targeted analysis of secondary gas constituents and trace substances is essential for optimised operation. We have modern gas chromatographs equipped with various separation columns and detectors. They are connected to a special data system that uses highly developed methods for the analysis of natural gases, coke oven gases, biogases, sewage and fermentation gases, waste gases, process gases, and test gases.

We use a numerous calibration gases for exact analysis and quantification of gases with all kinds of compositions with respect to primary, secondary and trace constituents.

The chromatographic data system makes all calibrations and evaluations comprehensible and reproducible at all times.

To analyse complex and/or unknown mixtures, we use a system coupled with a mass-specific detector. Liquid samples based on hydrocarbons or mineral oil can also be investigated. This is achieved with a system equipped with an automatic sampler that can separate mixtures up to C<sub>40</sub> and then quantify them.



**Your contact**  
Dr Rüdiger Forster | T +49 201 3642-18620  
ruediger.forster@open-grid-europe.com  
  
Marc-André Lehmann | T +49 201 3642-18745  
marc-andre.lehmann@open-grid-service.com



**left**  
Sample preparation

**right**  
Samples for trace analysis  
using ion chromatography



Controlled quality: chemistry for all aspects of natural gas

## Spectroscopy

**In addition to the analysis of natural gases and fuel gases, there are many chemical analysis questions that are of crucial importance for smooth and trouble-free transport in a natural gas transmission system.**

Detailed knowledge of trace substances in the natural gas network makes it possible to identify potential problems at an early stage so that all necessary measures can be instigated in good time.

These include, in particular, the chemical analysis of liquid and solid deposits, corrosion products, and all kinds of residues.

A continuous chemical analysis of all relevant operating materials is essential during regular routine maintenance to permanently ensure the availability and operational readiness of compressor stations, natural gas drying units as well as measuring and control systems.

The focus is not only on testing the serviceability of the operating materials, but particularly on chemical corrosion protection. We also offer our services for the analysis of water, oil and drying glycol to third parties.

To prevent environmental and health hazards due to harmful substances, we have a comprehensive arsenal of methods for measuring pollutants at the workplace and in environmentally relevant matrices such as soil, water and air. Likewise, we also answer questions on interpretation and application of legal provisions relating to dangerous substance/dangerous goods (GHS/ADR) as well as environmental law and provide assistance in the preparation of standard operating procedures in accordance with Section 14 of the German Hazardous Substances Ordinance.

For our analytical work we use all modern methods of atomic and molecular spectroscopy and electrochemistry as well as a number of chromatographic analysis systems. Our laboratory information system provides seamless and traceable documentation of all samples.



**Your contact**  
Dr Markus Wolf | T +49 201 3642-18687  
markus.wolf@open-grid-europe.com  
  
Dominique-Marc Buttler | T +49 201 3642-18632  
dominique-marc.buttler@open-grid-europe.com



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Dew point mirror

right  
Gas sampler



Local services

# Chemical engineering

**Transmission system operators are responsible for the natural gas they transport. The limit values for the gas quality are set out in contracts as well as in DVGW Code of Practice G 260.**

In addition to the limit values for combustion data such as calorific value, heating value and Wobbe index, the DVGW Code of Practice G 260 defines limit values for the hydrocarbon condensation point and for the contents of accompanying substances in the gas, such as water, oxygen and sulphur.

For Open Grid Europe as a transmission system operator, it is important to monitor the natural gas entering the network. This is the only way to protect and secure the network to ensure that the end customers receive gas that conforms to the regulations. The Gas Quality Competence Centre ensures that the measuring devices used in situ are measuring correctly, e.g. by sampling at all important entry points and that the natural gas trans

ported by Open Grid Europe corresponds to the specifications. It is a matter of principle that we also offer our comprehensive expertise as a service.

### Sampling and tests on site

Before analyses are carried out, it is essential that qualified samples are taken. Just like the analysis itself, this has a considerable influence on the end result. We have employees with many years of experience and expertise who carry out the sampling and measurements on site.

### Gas leak measurements

High-pressure pipelines are regularly inspected from the air\* or from the ground in urban areas. Anyone discovering a methane leak often asks him or herself the question of whether it is natural gas or gas from fermentation or mining. This question can only be answered by means of qualified sampling and subsequent laboratory analysis.

### Equipment checks

Open Grid Europe operates a large number of different measuring points to monitor the gas quality. These need to be checked at regular intervals to ensure that they measure correctly. This includes taking gas samples at the site and analysing them in our laboratory, which has been accredited for gas analysis.

### Measurement solutions

We have a large number of measuring facilities for continuous monitoring of the gas quality. Where necessary, we can offer individual measuring solutions for your particular application case in our mobile laboratory or in a measuring container. Please contact us – we can provide a solution.

### Feasibility studies

To keep our specialist knowledge up-to-date, we work closely with universities in the fields of thermodynamics as well as process engineering, chemical engineering and metrology.



**Your contact**  
Dr Markus Wolf | T +49 201 3642-18687  
markus.wolf@open-grid-europe.com  
  
Theo Anderbrügge | T +49 201 3642-18627  
theo.anderbruegge@open-grid-europe.com

\* For more details, please refer to our brochure CHARM® – laser-based system for remote gas detection