

GASODOR®
S-FREE

**SAFE
ECOLOGICAL
INNOVATIVE**

**THE WORLD'S FIRST
SULFUR-FREE ODORANT**





THE ENERGY OF THE FUTURE

NATURAL GAS TODAY

The earth is warming. The 2007 UN report on climate change removes all doubts, calling upon all members to take an active role in helping protect the earth's climate. The energy sources that we put into place today will have a critical influence on the climate of tomorrow, which is why now is the time to prove their suitability for the future.

Natural gas is one of the most environmentally friendly sources of energy available.

GASODOR® S-FREE

THE WORLD'S FIRST SULFUR-FREE NATURAL GAS ODORANT

Invisible and odorless: natural gas has no natural odor of its own, which is why safety considerations have prompted the addition of sulfur-containing odorants – odorants that, given their environmental impact, are no longer viable for the future. There is an ecologically sound alternative, however, which is raising the bar for natural gas odorants.

THE NATURAL GAS OF THE FUTURE: ODORANTS WITH NO SULFUR NOTES

It could be described as a milestone in natural gas odorizing: GASODOR® S-FREE, the world's first sulfur-free natural gas odorant, is a Symrise innovation with enormous potential for the future – it is the result of years of research and development efforts conducted in close cooperation with E.ON Ruhrgas AG of Essen, Germany, and the German Technical and Scientific Association for Gas and Water (Deutscher Verein des Gas- und Wasserfachs e.V. or DVGW) headquartered in Bonn.

GASODOR® S-FREE has proven its value under real-life conditions. Since launched on the market in 2001, the excellent properties of this sulfur-free odorant have been put to the test every day in countless supply networks. And world demand for sulfur-free natural gas odorants is continuing to grow at a rapid rate.



Countless high-pressure networks and urban and municipal supply areas have already made a successful switch to natural gas with sulfur-free odorants. GASODOR® S-FREE combines environmental compatibility with the highest standards of safety, efficiency and technology.

Gas companies are also facing their responsibility for protecting the environment and the climate. Thanks to GASODOR® S-FREE, Symrise can offer the gas industry a high-quality, sulfur-free odorant for natural gas that meets all environmental requirements as well as the needs of energy suppliers.



TECHNOLOGICAL EXCELLENCE MAKES ALL THE DIFFERENCE

Energy suppliers, utilities and service providers have a right to have expectations of an innovative, forward-looking technology like sulfur-free natural gas odorizing. And the arguments in favor of using GASODOR® S-FREE are convincing.

REGARDING ODORANT BEHAVIOR:

Extremely low odorant loss is among its excellent properties.

ADSORPTION AND STABILITY:

This sulfur-free odorant remains extremely stable in gas lines with very little adsorption taking place.

COMPATIBILITY BONUS:

Compatibility of GASODOR® S-FREE with a wide variety of gas line materials is excellent.

THE ADVANTAGE OF VERSATILITY:

No need for new facilities. GASODOR® S-FREE can theoretically be used in any existing odorizing systems.

AND YET ANOTHER ADVANTAGE:

The new odorant can also conceivably be used in applications such as fuel cells, which would be sensitive to sulfur.

DISTINGUISHED BY A HIGH DEGREE OF SAFETY

Working with natural gas requires a great deal of responsibility – safety is the number one priority and cannot be compromised.

GASODOR® S-FREE is hallmarked by its outstanding safety profile: its odor provides a clear warning of natural gas and, as such, meets all of the requirements for safe usage in natural gas networks.

While natural gas may be available at all times, its consumption in industry and among consumers is subject to daily and seasonal fluctuations. What this means is that natural gas may linger within the gas lines for varying periods of time, requiring an odorant with proven stability. GASODOR® S-FREE keeps its promises. This sulfur-free odorant maintains its characteristic odor even after remaining in gas lines for extended periods of time, e.g., during the summer or in branch lines.

DVGW certification in accordance with DIN EN ISO 13734 is part of the individual profile for GASODOR® S-FREE, of course, as is the fact that it is firmly anchored within the body of European regulatory directives.



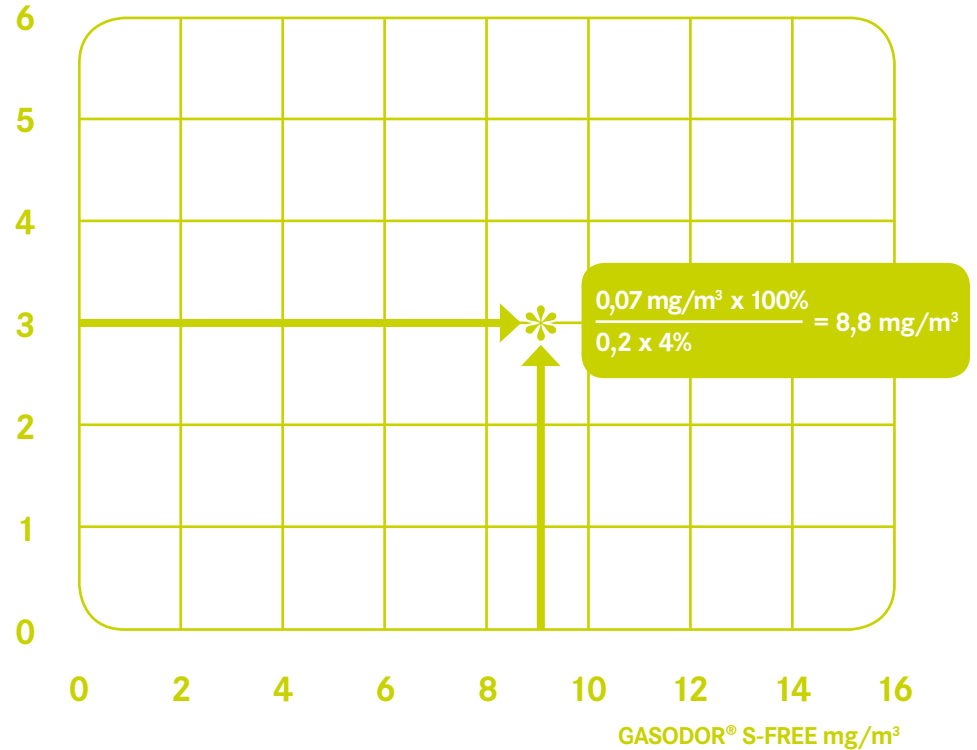
IMPROVED EFFICIENCY FOR A COMPETITIVE EDGE

Environmentally *and* economically sound – convincing examples of this combination can be found in many areas today, and energy supply is no exception. GASODOR® S-FREE is one such example. More is less when it comes to sulfur-free odorants, because a low concentration of odorant achieves two goals for utilities: it improves efficiency and puts environmental protection into practice.

Another bonus in terms of efficiency is the outstanding stability of GASODOR® S-FREE. Loss of odorant throughout the entire gas distribution network is extremely low – definitely an advantage when it comes to economizing consumption both of the product and of resources. It could even make economic sense to potentially introduce odorants from a central location.

MINIMUM CONCENTRATION OF ODORANT IN NATURAL GAS (mg/m³)

Level of intensity
(as defined by the DVGW)



LEVELS OF ODOR PERCEPTION

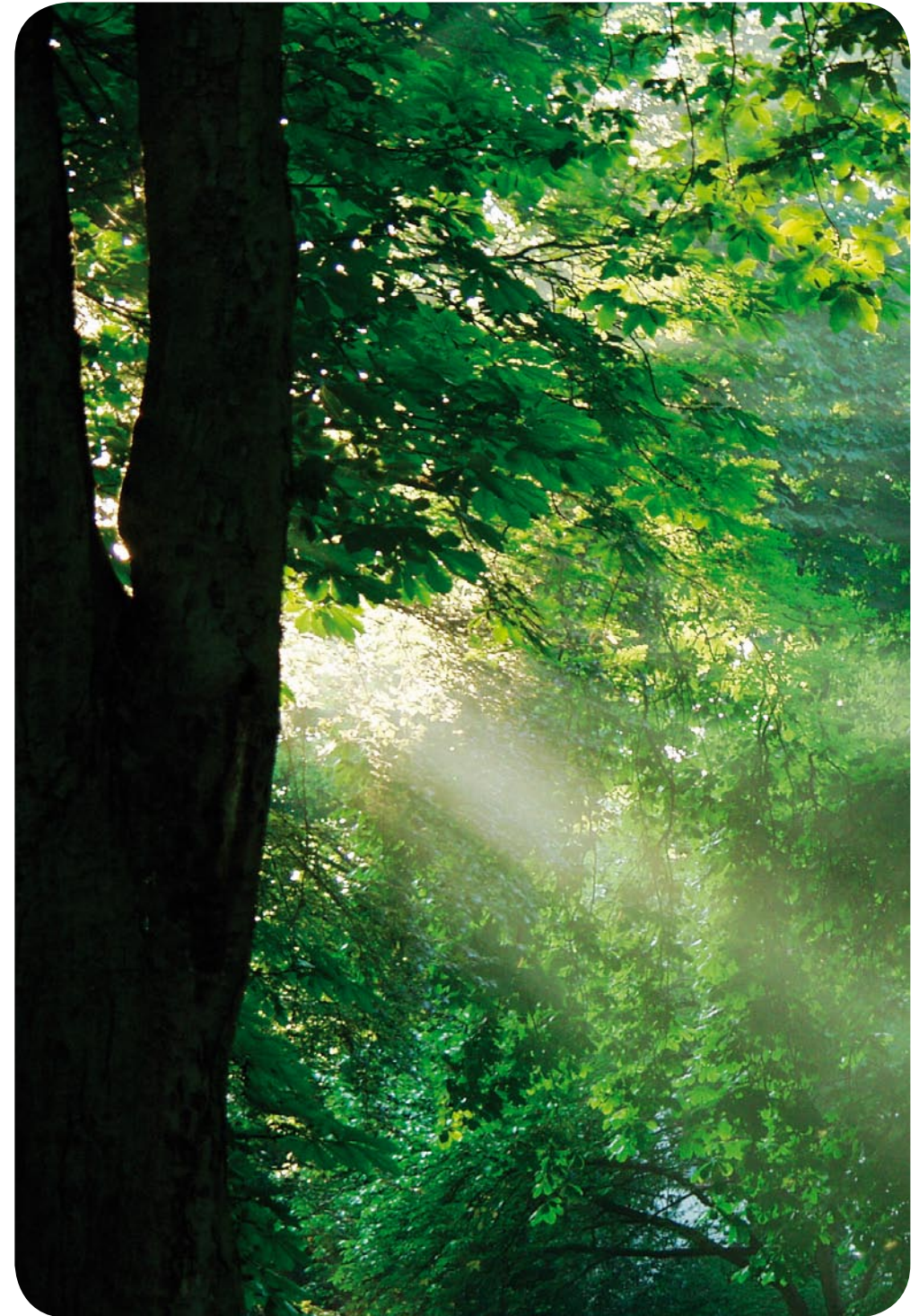
- 6 extremely strong
- 5 very strong
- 4 strong
- 3 noticeable
- 2 weak
- 1 very weak
- 0 imperceptible

Note: Odor intensity categorized as stipulated in VDI 3882, page 1.

Climate protection is a global challenge. Selecting energy sources wisely, using them efficiently and consuming them sparingly are critical considerations.

Consumers expect natural gas utilities to provide an environmentally sound source of energy – reducing sulfur dioxide emissions is simply part of that expectation. Innovations such as GASODOR® S-FREE from Symrise are making energy sustainable for the future.

Symrise – always inspiring more...



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