

Rüdiger Fischer

## **KEY PRODUCT: ADBLUE.**

**What is AdBlue, why is the demand rising, and are there differences in quality?**

### **Euro 6: What now?**

The Euro 6 standard defines emission standards introduced by the European Union to improve air quality and reduce environmental impacts from vehicle emissions. The standard sets strict limits for various pollutants, including nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), hydrocarbons (HC), and particles. The introduction of the Euro 6 standard marked a significant milestone in the pursuit of cleaner and more environmentally friendly vehicles on European roads. Compliance with these stricter requirements for diesel vehicles would have been unimaginable without AdBlue technology.

The diesel scandal that came to light in 2015 had far-reaching effects on the reputation of diesel as a propulsion technology and on the perception of AdBlue as a solution for exhaust gas purification. The fraudulent manipulation of emission values by some automotive manufacturers unsettled consumers' confidence in them. However, this does not change the fact that thanks to AdBlue, the nitrogen content in exhaust gases is reduced by over 90%.

### **What exactly is AdBlue?**

AdBlue is an aqueous solution consisting of 32.5% high-purity urea and 67.5% demineralized water, according to ISO 22241. AdBlue is a brand owned by the Association of the German Automotive Industry. The function of AdBlue is based on a process called selective catalytic reduction (SCR). In this process, AdBlue is injected into the vehicle's exhaust stream before it passes through the SCR catalyst. In the heat-resistant environment of the catalyst, AdBlue decomposes into ammonia (NH<sub>3</sub>) and carbon dioxide (CO<sub>2</sub>). The ammonia then reacts with the nitrogen oxides (NO<sub>x</sub>) in the exhaust, converting them into nitrogen (N<sub>2</sub>) and water (H<sub>2</sub>O). The result of this reaction is a significant reduction in nitrogen oxide emissions, which not only theoretically complies with exhaust standards but also effectively improves air quality.

### **AdBlue as a Key Innovation for Climate-Sensitive Transport**

Despite the diesel scandal and associated controversies, AdBlue remains a key innovation for more climate-friendly transportation. Diesel engines are still indispensable in many areas, particularly in:

- transportation
- heavy-duty vehicles
- agriculture
- commercial vehicles

They also offer high efficiency and range. AdBlue helps reduce the environmental impacts of these engines and maintain their benefits for economically highly relevant sectors by contributing to nitrogen reduction and increasing fuel efficiency.

## **Production Capacities Must be Expanded**

The main cause of the increase in AdBlue prices is the geopolitical tensions that has become the reality for all industries due to the Ukraine war. Natural gas is a crucial component in the production of high-purity urea, the main ingredient of AdBlue. It is used to produce ammonia, which in turn serves as a raw material for urea production. Natural gas has always been a limited resource, and its availability and price depend on various factors such as supply and demand, extraction, and transportation costs. Any change in any of these areas directly affects the costs of AdBlue production. On the other hand, urea is extremely sought after in the market as a raw material for fertilizer production, which has seen significant growth in recent years.

In 2022, amid the so-called AdBlue crisis, prices increased by up to 2000%, and there were instances of depletion. Manufacturers and shippers warned about the collapse of transportation and thus all supply chains, advocating for the recognition of the industry as systemically relevant. To address this challenge, AdBlue manufacturers are striving to optimize their production processes and seek alternative sources for high-purity urea. Only by reducing dependence on individual sources and diversifying their supplier portfolios can they ensure cost and supply stability in the future.

## **From Practice: Criteria for Quality in Production**

Although AdBlue must adhere to an international quality standard according to ISO 22241, there are still quality differences between different products on the market. During the construction of the EMKA AdBlue plant, two key factors were at the forefront to ensure the effectiveness of the additive. The crucial factor for the quality of AdBlue is the purity of the ingredients, especially urea and demineralized water. High-quality urea is essential for the effectiveness of exhaust gas purification and the prevention of deposits in the vehicle's exhaust after-treatment system. Contaminants in the raw materials can affect the performance of AdBlue and lead to malfunctions in the SCR system. Furthermore, differences in manufacturing and storage methods can affect the quality of AdBlue. Proper manufacturing and storage are important to ensure the stability of the solution and minimize the risk of crystallization, contamination, or chemical reactions that could affect the effectiveness of AdBlue and, in the long run, damage vehicles.

## **Contact us**



EMKA Schmiertechnik GmbH, Schmalbachstrasse 19, 74626 Bretzfeld-Schwabbach, Germany  
Phone +49 7946 94 470-0, eMail [presse@emka-oil.de](mailto:presse@emka-oil.de)