



AdBlue®

The NO_x reduction agent for vehicles with
SCR exhaust after treatment



AdBlue® from SKW Piesteritz for the highest quality, secure supply and system solutions tailored to meet market needs

AdBlue®

High purity aqueous 32.5% urea solution

Standards and guidelines

ISO 22241

Diesel engines – NO_x reduction agent AUS 32 –

part 1: Quality requirements

part 2: Test methods

part 3: Handling, transportation and storage

AUS 32 – Guidelines for Quality Assurance

(the current version can be found on the Internet at www.petrochemistry.net)

AdBlue® is a registered trade mark of the Verband der Automobilindustrie e.V. (VDA)

SCR exhaust aftertreatment requires AdBlue® urea solution as a NO_x reduction agent. The SCR catalytic converter needs highly pure AdBlue® that meets strict standardized quality parameters to function perfectly. SKW Piesteritz guarantees this quality through a production process integrated in the urea plant and highly effective quality assurance systems.

As the largest urea producer in Germany SKW Piesteritz also has a correspondingly large capacity for the production of AdBlue®. A specially constructed tank farm with a storage volume of approx 13,000 cubic metres and a separate road

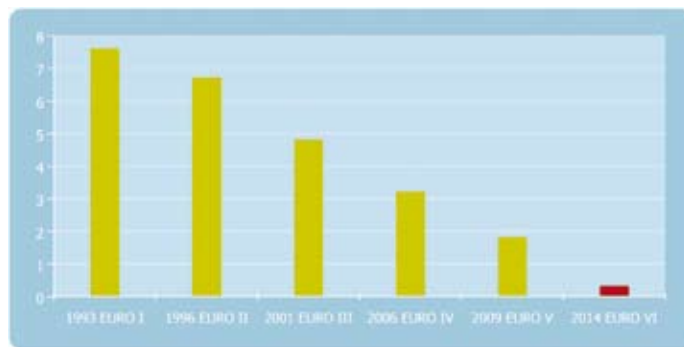
shipment facility that enables two tanker vehicles to be loaded simultaneously 24 hours a day without any limitations, safeguards the rapid and reliable supply of AdBlue® to our customers.

Our marketing and research/analysis staff have been integrated into the development of the product and its standardisation right from the start. The extensive expertise of our staff is at your disposal to answer all your questions and provide solutions to all your problems.

SKW Piesteritz works together with carefully selected sales partners who can offer complete system solutions, specialist advice and an extensive range of services.

SCR exhaust after treatment with AdBlue® – a system that has proved itself

Since EURO IV came into force for commercial vehicles the manufacturers of commercial vehicles and buses have been offering vehicles with SCR exhaust after treatment. The system has proved itself. The spectrum of vehicles fitted with the system continues to grow, and ranges from heavy trucks, through buses, to light commercial vehicles.



Development of NO_x limits (for commercial vehicles) in mg/kWh

The infrastructure for the supply of AdBlue® is being continuously improved. Many hauliers are choosing dedicated sources of supply. But the public network of filling sta-

tions with AdBlue® pumps is also becoming more extensive. In addition many filling stations are offering AdBlue® in canister form as 'emergency supplies'.

Fulfilment of the ever stricter regulated emissions standards such as EURO V (from October 2009 for new vehicles) and EURO VI (probably from October 2014) will be impossible without SCR technology. This

technology is already being applied in the USA, even in the private car sector, before it also finds its way into the European market in 2009.

With AdBlue® from Piesteritz protect the environment and lower your costs

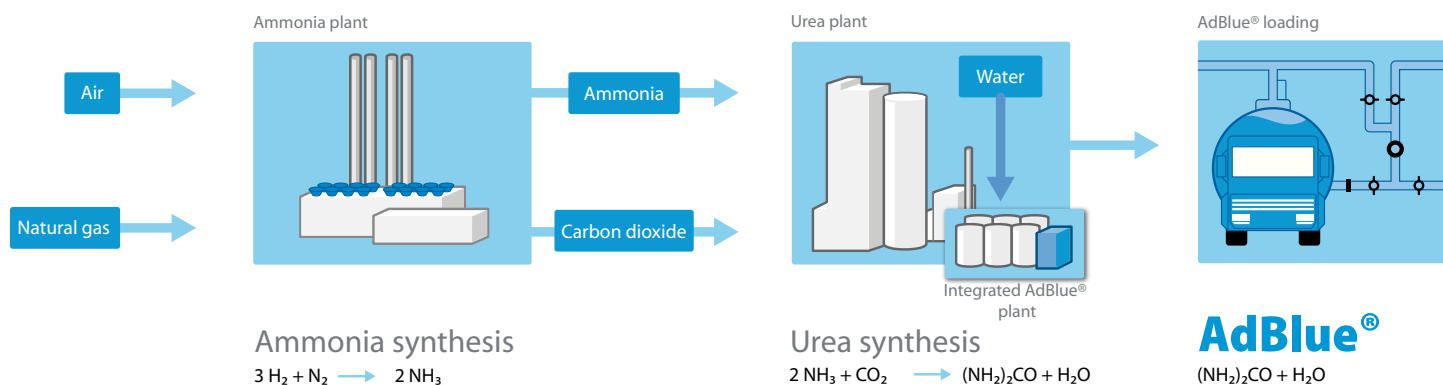
Quality guaranteed, thanks to a special production process and a certified quality management system

For trouble-free functioning of the SCR technology it is important that the AdBlue® quality parameters defined in the standard are adhered to exactly. SKW Piesteritz's special production process provides the essential basis for such adherence.

Ammonia and carbon dioxide are firstly produced from natural gas and air (ammonia synthesis). These are in turn the starting materials for the manufacture of urea (urea synthesis). Production of high purity AdBlue® urea solution is integrated into the urea plants with the use of an appropriate water quality. This process, specially adapted to the

existing urea plants, guarantees that only the purest raw materials are used. Any external influence on the quality of the raw materials as a result of transport, handling or storage is excluded.

SKW Piesteritz guarantees high purity AdBlue® in accordance with current standards and monitors exact adherence to the quality parameters by means of its extensive quality management system. Adherence to CEFIC's AUS 32 quality guidelines is also guaranteed. This applies also to our collaboration with selected sales partners. Only goods that have been checked are allowed to be despatched. A certificate is issued for each delivery.

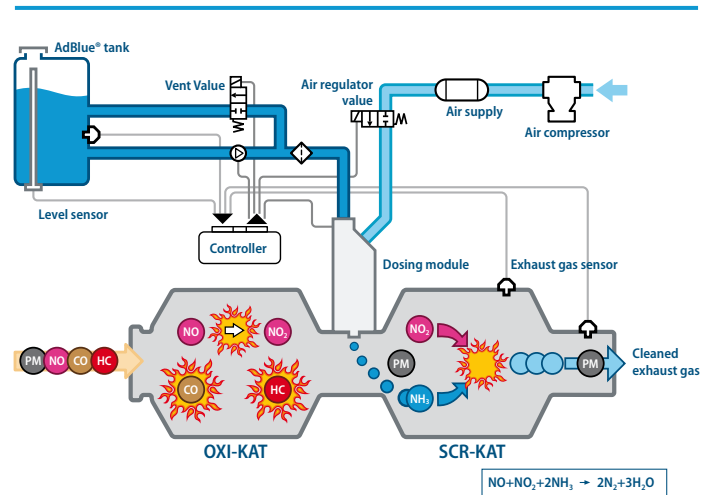


The function of SCR technology

In SCR technology, the engine is optimized with the intention of producing few carbon particulates but lots of nitrogen oxide instead. The reducing agent AdBlue® is then jetted into the exhaust flow. AdBlue® is a non-toxic, highly pure urea solution that is carried in the vehicle in a separate tank.

In the exhaust flow, AdBlue® is hydrolyzed into ammonia and carbon dioxide due to the high temperatures. At the surface of the SCR catalytic converter, the ammonia reacts with the nitrogen oxide to form nitrogen and water, i.e. completely non-toxic, natural components of air.

SCR technique reduces the particle emissions, the toxic NO_x components in the exhaust and, as a positive side effect, also reduces fuel consumption. The SCR equipment is also completely maintenance-free and designed for the life of the vehicle.



Function of the SCR exhaust aftertreatment using AdBlue®

The advantages that AdBlue® from Piesteritz gives you

- » Integrated production in a continuously operating urea process plant
- » Online monitoring of the production process in all its stages
- » ISO-certified quality management system
- » Secure availability thanks to large tanks with a total volume of approx 13,000 cubic metres
- » Short despatch times as a result of a separate covered twin-track road shipment facility, in which the shipping process is coupled with SAP
- » Extremely accurate shipments by means of flow rate measurement – as a result no additional vehicle weighing procedure necessary
- » All facilities for production, storage and shipment are used exclusively for AdBlue®
- » Batch size is defined in terms of a tank volume of 1,000 cubic metres
- » Only fully analysed and authorised goods are allowed to be sold, 100% traceability guaranteed
- » Sample retained from each vehicle filled



AdBlue® shipment



AdBlue® tank storage



AdBlue® filling station in operation

Transportation, handling and storage

AdBlue® is non-hazardous for both people and the environment. It is non-toxic, non-flammable and is classified in accordance with the German Water Resources Act in the lowest water hazard class (WGK 1). AdBlue® is neither a dangerous substance nor dangerous goods.

The durability of AdBlue® without any loss of quality is affected by storage conditions. It crystallises at -11°C and a hydrolysis reaction sets in above 35°C, i.e. a slow decomposition into ammonia and carbon dioxide starts to occur. It is essential to prevent direct solar radiation onto unprotected storage tanks.

Minimum durability as a function of storage temperature

Constant storage temperature (°C)	Minimum durability (months)
≤ 10	36
≤ 25	18
≤ 30	12
≤ 35	6
> 35	Check goods before use

AdBlue® may only be allowed to come into contact with materials that are resistant to urea solutions. Stainless steels and most plastics are suitable. Materials containing copper and zinc are unsuitable, as is aluminium. All packaging, and transport and storage containers should be used exclusively for AdBlue®.



Modern tanker loading facility at SKW Piesteritz

Sales partners providing a full range of services Advice – sales – distribution

Our carefully selected distribution partners, e.g. KRUSE KG, offer a truly comprehensive range of services for the AdBlue® product.

AdBlue® deliveries are rapid and reliable.

Reputable suppliers certified for AdBlue® tank systems can be chosen from an extensive range, or can also be individually selected. The tank equip-

ment is technically supervised. When individually customised tank facilities are being constructed the customer receives technical advice and customisation services that adhere to current guidelines and regulations, such as e.g. TRwS 781-2 "Vehicle fuelling with aqueous urea solution" (TRwS = Technical regulations for substances hazardous to water).

IBC with filling system (1000 l)



System Titan



System Flaco



Examples: Configurable refuelling technology to meet your needs

AdBlue® for your success



Fulfil the relevant current emissions standards with a modernly equipped vehicle fleet and take advantage of state support and incentives..

AdBlue® from SKW Piesteritz



You can rely on the largest ammonia and urea producer in Germany for the best quality, assured supply and expert distribution partners.

AdBlue® for our future



SCR exhaust aftertreatment reduces particle emissions, nitrogen oxide and fuel consumption. The earlier that the technology becomes widespread, the better for the environment.

Services that we can provide for you

If you have any questions or requests, please get in touch with us. You will receive full answers to all your questions from our very capable staff.

You can also find FAQs and more detailed information on the subject of AdBlue® on our web pages.

We will also put you in touch with one of our distribution partners who can provide the best logistical services for your region.

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