AH14.40-N-0001-01AB	Notes on use, material properties and handling of AdBlue®	ENGINE all	

Concept
AdBlue® is the trade name for the diesel engine NO_x reducing agent with the standardized designation ISO 22241.

Tasks of AdBlue®
AdBlue® serves to convert nitrogen oxides into water vapor and nitrogen.

Chemical characterization and composition of AdBlue®
The urea content is 32.5%. AdBlue® consists of urea dissolved in demineralized water. AdBlue® is not an additive.

Chemical formula:	$H_2N\text{-}CO\text{-}NH_2$
Molecular weight (urea):	60.06 g/mol
CAS (Chemical Abstracts-Service) No.:	57-13-6

Physical and chemical properties of AdBlue®

Status:	liquid
Color:	colorless, clear, light yellow
Odor:	slight ammonia smell
pH value:	10 (hydrous solution, 10%)
Crystallization temperature:	-11°C/12°F
Boiling point:	103°C/217°F
Self ignition temperature:	not self igniting
Density:	about 1.09 g/cm^3 at 20°C/68°F
Viscosity, dynamic:	about 1.4 mPas at 25°C/77°F

Working with dirty materials
One must, at all costs, prevent AdBlue® from coming into contact with materials used in the interior of the vehicle. AdBlue® exposed to air passes within just a few hours from a liquid state into the crystalline state and can therefore damage and destroy contaminated surfaces.
Textiles, e.g. the anti-slip mats, which have been fouled with AdBlue® should be cleaned a number of times in rotation and flushed with water.
One must ensure that there are no further traces of AdBlue® in the textiles.

Working with dirty tools
All tools coming into contact with AdBlue® must be thoroughly cleaned immediately after use using water!
Only fully dried measuring instruments and filing tools should be used so as not to dilute the AdBlue® concentration.

Working life and durability
AdBlue® breaks downs during storage into ammonia hydroxide and carbon dioxide and then no longer fulfills the requirements of the standard ISO 22241.
If the recommended storage temperature of a maximum of 25°C/77°F is maintained, the AdBlue® will fulfill the requirements of this standard for at least 18 months after manufacture. If this recommended storage temperature is exceeded then this period is reduced. Duration of storage and the temperatures to be used are given as guideline values at the end of the document. At temperatures under -11°C/12 °F the AdBlue® freezes and becomes solid.
On warming up again the frozen AdBlue® becomes liquid again and can be reused without any loss of quality.
The maximum permissible period of use of AdBlue® can be taken from the **MB Specifications for Operating Fluids**.

Marking
Filling plant for discharging AdBlue® is marked with the standard designation ISO 22241 or with the trade designations AdBlue® or Diesel Exhaust Fluid (DEF).

Transport
AdBlue® is carried in a container for vehicles with BlueTEC technology.

Working with dirty operating fluids
One must strictly ensure that AdBlue® is kept separate from other operating fluids, fuels and lubricants such as coolant, engine oil, transmission oil, fuel, hydraulic fluid and brake fluid and not used in the same containers and collecting pans. The smallest amounts of AdBlue® can damage thermostats or temperature sensors. Operating fluids which contain traces of AdBlue® must not be used again.

Working with dirty AdBlue®
AdBlue® must be checked as per the repair instructions before every fill. Individual components of the BlueTec system already react very sensitively with even the smallest traces of contaminants in AdBlue®. When handling AdBlue® it is important, therefore, to always use clean containers and collecting pans which are only reserved for this purpose. Dirty AdBlue® must not be used again.

Protecting vehicle components when working with AdBlue®
AdBlue® leads to corrosion on electronic components and strong fouling on all other materials. It is therefore necessary to cover up all components in the vicinity over the whole surface with plastic foil when working in circumstances where AdBlue® could leak out.

Storage and packaging
Storage at temperatures between 0°C/32°F and 25°C/77°F should be secured in order to avoid crystallization occurring in AdBlue®. To avoid deterioration in quality due to contamination, AdBlue® must only be handled in storage and filling systems intended exclusively for AdBlue®. Suitable container materials are alloyed steel, various plastics and plastic coatings in metal containers. One should not use unalloyed steel, aluminum, copper, copper-containing alloys and zinc-dipped steel.

Disposal and degradability
Disposal of AdBlue®:
When disposing of AdBlue® one should observe the legal requirements of the country in which the AdBlue® is used.

Dirty packaging/materials:
Packaging which contain residues of AdBlue® is to be handled like the substance itself. Packaging should emptied as well as possible; it can then be reused after appropriate cleaning with water.

Constant ambient conditions Storage temperature in °C/°F	Durability in months
≤10/50	36
≤25/77	18
≤30/86	12
≤35/95	6
>35/95	--