® = Registered trademark of
Verband der Automobilindustrie

AdBlue®

Very pure NO_x-reduction agent for Diesel engines equipped with SCR catalysts.

AdBlue fulfills the quality requirements drafted in the preliminary standard DIN V 70070.

Chemical nature	Urea, carbamide, in ultra pure water
CAS No.	57-13-6
EINECS No.	200-315-5
Physical form and packaging	**AdBlue** is supplied in road tankers, IBC's and cans.
Shelf life	In vented tanks, which are protected from sun light and dust, **AdBlue** has a shelf life of 12 months, if the storage temperatures do not exceed 30 °C, and if an average storage temperatures of 20°C is maintained. In closed containers **AdBlue** has a shelf life of 9 months, if the storage temperatures do not exceed 30 °C, and if an average storage temperatures of 20°C is maintained.

Properties

Delivery specification

Test Item	Unit	Limits	Test method
Urea content	% w/w	31.8 – 33.2	DIN V 70071 Ann. B
Density at 20°C	g/cm³	1.0870 - 1.0920	DIN EN ISO 12185
Refractive index at 20°C	--	1.3817 - 1.3840	DIN V 70071 Ann. C
Alkalinity as NH_3	% w/w	0.2 max.	DIN V 70071 Ann. D
Biuret	% w/w	0.3 max.	DIN V 70071 Ann. E
Aldehydes	mg/kg	5 max.	DIN V 70071 Ann. F
Insolubles	mg/kg	20 max.	DIN V 70071 Ann. G
Phosphate	mg/kg	0.5 max.	DIN V 70071 Ann. H
Calcium	mg/kg	0.5 max.	DIN V 70071 Ann. I
Iron	mg/kg	0.5 max.	
Copper	mg/kg	0.2 max.	
Zinc	mg/kg	0.2 max.	
Chromium	mg/kg	0.2 max.	
Nickel	mg/kg	0.2 max.	
Aluminium	mg/kg	0.5 max.	
Magnesium	mg/kg	0.5 max.	
Sodium	mg/kg	0.5 max.	
Potassium	mg/kg	0.5 max.	

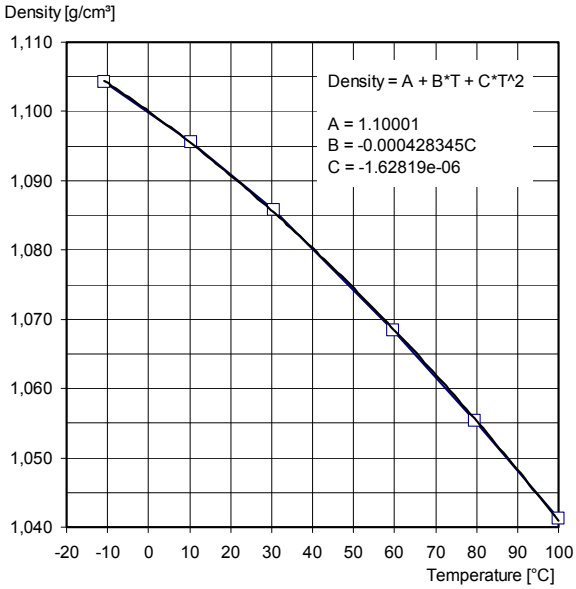
Other properties

Identity	--	Identical	DIN V 70071 Ann. J

These specification will be amended as soon as there are changes resulting from the ongoing standardization process, to maintain compliance with the most actual standard.

Physical properties

Density p(T)



Source:
Exp. data , BASF

Melting enthalpy of frozen AdBlue

Melting enthalpy: +270 J/g
Melting range (2 K/min): (-20°C) – (-6°C)
Source: Exp. data , BASF

Specific heat capacity Cp(T) of liquid AdBlue

T [°C]	Cp. exp. [J/g*K]
25.04	3.51
45.04	3.57
65.02	3.64

$Cp(T) = 8E\text{-}06*T^2 + 0.0027*T + 3.4345$

Source: Exp. data , BASF

Specific heat capacity Cp(T) of frozen AdBlue

T [°C]	J/(g*T)
-42,0	1,49
-36,0	1,53
-30,0	1,59

Source: Exp. data , BASF

Vapour pressure above liquid AdBlue

T [°C]	$Pressure_{exp}$ [hPa]
20.08	23.0
30.26	41.1
40.19	70.6
55.18	150.3
70.26	306.9
85.21	609.8
100.21	1182.2

$\ln(p/bar) = 13.9461 - 5198.36/(273.15 + T)$

T [CELSUS]
Mean dev., est.: 3%

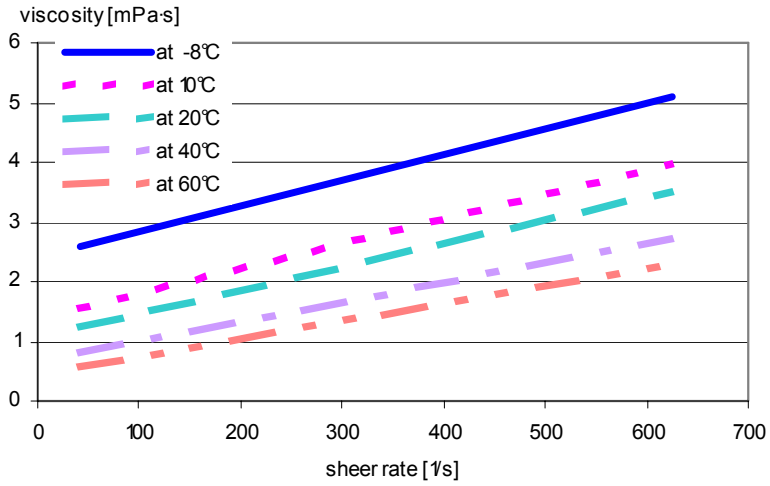
$\ln(p/Pa) = 25.45899 - 5198.351/T$

Mean dev., est.: 3%

Source: Exp. data , BASF

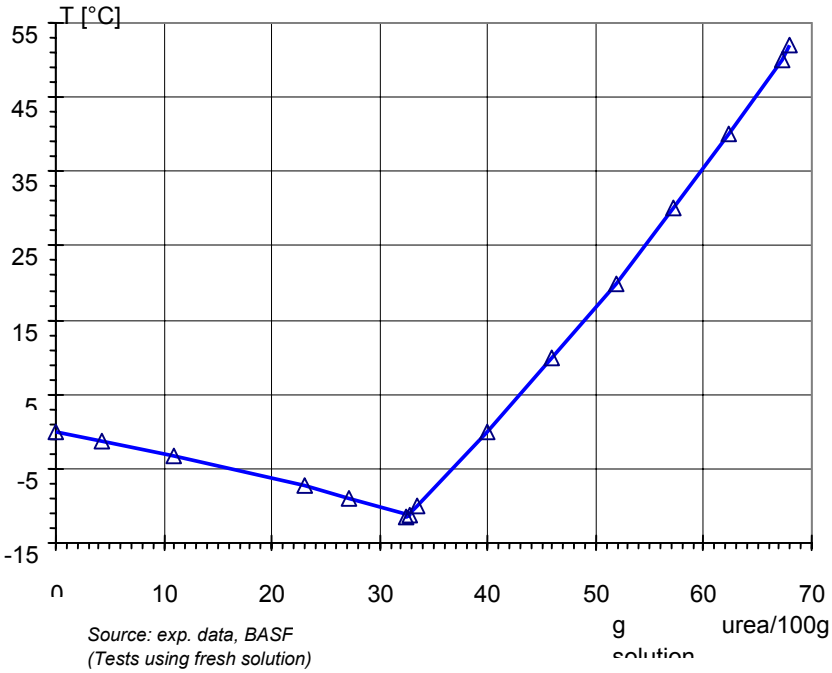
Thermal conductivity approx. 0.570 W/m·K at 25°C

Viscosity approx. 1.4 mPa·s at 25°C



Surface tension min. 65 mN/m at 20 °C

Freezing point f(T,m) of urea solution



Source: exp. data, BASF
(Tests using fresh solution)

Chemical properties

AdBlue has a faint alkaline reaction. The pH of a freshly prepared solution is of the order of 9.0 to 9.5. During storage a pH value of approx. 10 might be reached.

The dissolved urea decomposes slowly even at room temperature, generating ammonia and carbon dioxide. The rate of this reaction increases if the solution is heated. Above approx. 70 °C biuret is formed additionally at a significant rate.

Materials resistance

Equipment coming into contact with **AdBlue** can be made of alloyed austenitic Cr-Ni-steels or Cr-Ni-Mo-steels according to EN 10088-1 to -3 (e.g. 1.4541 and 1.4571). Steels of an equivalent quality (e.g. according to US standards) can be used without any restriction.

Non alloyed steels, zinc coated steels, copper, and alloys containing copper are not suitable due to their poor resistance towards urea, urea solution, or the ammonia dissolved therein.

Polymers, e.g. polyethylene, polypropylene and polyoxymethylene are suitable at temperatures up to 60°C. Sealings may be made of PTFE or EPDM.

However, the properties of parts made of polymeric materials depend to a considerable extent on blending and processing during the manufacturing process. Therefore, for any polymeric material the supplier should be requested to submit for their product resistance data towards **AdBlue**, which are tailored for the intended use as well as for the intended operating temperature.

Any other material not cited above must be tested regarding corrosion resistance and possible influences on the product specification.

Safety

Physiological data

AdBlue is not a hazardous substance in the sense of the German Gefahrstoffverordnung.

Handling

When using this product, the information and advice given in our **Safety Data Sheet** should be observed. Due attention should also be given to the **precautions** necessary for handling chemicals.

Storage and transportation

AdBlue is not a dangerous substance for transportation. Owing to its chemical nature, however, it must be transported and stored separately from nitrites.

Transportation should be made in insulated tanks or on plastic tank pallets (IBC).

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

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