

VDA AdBlue® Containers up to 5 Litres for Passenger Cars

The following objective is associated with these VDA guidelines:

Definition of standards for AdBlue® refilling containers (in this case containers holding up to 5 litres).

Version dated May 2014

VDA project group “AdBlue®”

AdBlue® is a registered trademark of the VDA.

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1. Introduction

AdBlue® has already been in use in heavy commercial vehicles since 2005. The exhaust aftertreatment method using AdBlue® is called SCR (Selective Catalytic Reduction). This process decreases the emissions of nitrogen oxides after combustion in the vehicle's engine, through a chemical reaction that takes place in a downstream catalytic converter.

In future vehicle manufacturers will also offer this technology more frequently for passenger cars as a solution for complying with the strict Bin 5 limit values in the USA and the strict Euro VI exhaust standard for diesel vehicles applicable in Europe from 2014.

At present AdBlue® is generally not yet available to passenger car customers at filling stations.

As the requirements for exhaust emissions become more stringent, the consumption of AdBlue® will continue to rise. So AdBlue® will become a regular feature and motorists will have to fill up on it, just like diesel. This will require a customer-friendly infrastructure providing complete coverage.

However, it will not be possible simply to use the AdBlue® infrastructure already established for trucks, because it is fundamentally different from the AdBlue® infrastructure for passenger cars.

Given this backdrop, the automotive industry and the petroleum industry are already working on suitable consumer-friendly standardised solutions for containers and tank connectors.

2. Objective of this VDA Recommendation

The objective of this VDA Recommendation is to provide a standard specification for AdBlue® containers (concerning dimensions, construction design, quality, handling, etc.) for their application in passenger cars.

The main points of this Recommendation are:

1. Comparison, optimisation and, where appropriate, standardisation of existing containers in the member companies, associations and standards.
2. Definition of standards for handling containers used for refilling.

3. Mechanical and climatic criteria

All containers must comply with all the laws and standards applicable to the manufacture of the liquid, all components of the packaging, and to filling, transport, storage, sale, environmental and personal protection, and environmentally friendly disposal.

3.1. General requirements (cf. ISO 22241-3)

- The containers must be clean and properly sealed to protect against contaminating AdBlue®.
- All surfaces that come into contact with AdBlue® should be free of foreign matter (such as oil, diesel, grease, cleaning agents, dirt and other substances).
- Materials that come into contact with AdBlue® must be free of certain substances including copper, copper alloys, carbon steels, galvanised steels, zinc, lead, silver, aluminium and aluminium alloys.

3.2. Climatic criteria (cf. ISO 22241-3)

The following special properties of AdBlue® should be taken into consideration:

- To avoid crystal precipitation and hydrolysis, it is recommended that AdBlue® should be stored under normal ambient conditions, at a maximum temperature of 25°C for 18 months (according to shelf life in ISO 22241).
- To prevent crystallisation of AdBlue®, it should not be stored below -5°C.
- To avoid large increases in temperature, the containers should not be exposed to sunlight.
- Crystal formation around the closure (more force needed to twist off cap) must not interfere with opening.

4. Handling requirements

4.1. Repackaging

If AdBlue is repackaged, the new packaging must be designed such that it can be opened without additional aids. Carrying aids are desirable.

4.2. Containers

Container handling should be designed so that the filling procedure is simple, clean, and fast for the user.

The entire containers should satisfy the following requirements:

- They must conform with ISO 22241.
- AdBlue® should be stored either in separate tanks or in plastic containers. Alloyed steels, various synthetics and synthetic-coated metals, plastics free of additives are suitable materials for containers. Unsuitable materials include carbon steels, copper, and copper alloys. Materials not listed here should be checked for resistance to corrosion and possible influence on the product specification (cf. ISO 22241-3).
- The new packaging and the container must be marked “AdBlue® pursuant to ISO 22241”. If labels are used, they and their printing must be resistant to both water and AdBlue®. Traceability must be secured by identification (batch) number.
- Weight of container when full < 6 kg.
- Unmistakable and recognisable vehicle connection to the vehicle, including a securing device that avoids being disconnected during the re-filling.
- Connector system between container and vehicle’s filler pipes should prevent overfilling.
- Clean filling must be possible; there must be no soiling by AdBlue®.
- The system must be drip-free; the maximum spillage must be < 0.4 ml on each filling.
- Handling should be simple and self-explanatory.
- Instructions for use based on pictograms must be provided.
- Ergonomic (can be held in the filling position by the consumer, possibly with one hand).

- The containers must be easy to open; it must be possible to open the containers and the packaging by hand, without requiring the use of force and without tools.
- Simple and quick installation of the connector system.
- Rapid filling (minimum flow rate: 2.5 litres/min).
- The design must prevent incorrect use.
- Only small quantities of waste.
- Recyclable (minimum requirement: recyclable; reusable systems are preferred).
- The containers should discharge so that they are either completely empty or contain not more than 20 ml.
- Cap on the container should be of correct material (e.g. HDPE), as well as the seal (e.g. heat-sealed PTFE)

5. Definitions

AdBlue®: (ISO 22241/AUS32) is the trademark given to a colourless, synthetically manufactured 32.5 per cent solution of urea in demineralised water, which is used in the aftertreatment of exhaust in a Selective Catalytic Reduction (SCR) converter. SCR reduces the output of nitrogen oxides (NO_x) by around 90% (during stationary operation). The trademark rights to AdBlue® are held by the German Association of the Automotive Industry (VDA).