Media Information

Volkswagen

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Innovative twin dosing reduces NOx emissions by approx. 80 percent

- → **Double injection of AdBlue into the exhaust system enables significant reduction of nitrogen oxides**
- → **First use of the new technology in the Passat 2.0 TDI Evo[1], later also in the new Golf[2]**

Wolfsburg (Germany) – Since 2018, only SCR exhaust gas treatment systems have been used in Volkswagen models with diesel engines. SCR (selective catalytic reduction) technology significantly reduces nitrogen oxides in the exhaust gas. Volkswagen has now developed the next evolutionary stage of the SCR system – so-called "twin dosing". Adblue is injected selectively upstream of two SCR catalytic converters which are arranged in series. The system is used in the new Passat 2.0 TDI Evo with 110 kW (150 PS), which already meets the technical requirements of the future Euro 6d emission standard as a result.

Twindosing - double SCR injection

Current RDE (real driving emissions) measurements confirm Volkswagen's type approval: in the new 2.0 TDI Evo with twin dosing, NO_X levels are reduced by around 80 percent compared to the previous generation of the respective models.

Volkswagen will now gradually introduce the new technology to all models with 2.0 TDI Evo engines. Following the 2.0 TDI Evo with 110 kW (150 PS) currently fitted in the Passat, the new Golf – soon to see its world premiere – will likewise feature twin dosing in all TDI variants.

The twin dosing process requires a second SCR catalytic converter which is located in the underbody of the vehicle. Since the distance to the engine is greater, the exhaust temperature upstream of the second catalytic converter can be as much as 100°C lower. This expands the window for aftertreatment of exhaust gases: even at exhaust gas temperatures close to the engine of +500°C, the system is still able to achieve very high conversion rates. In addition, a blocking catalytic converter downstream of the SCR system prevents excess ammonia slip.

The innovative twin dosing process compensates for a system-based disadvantage of diesel engines. Modern diesel engines emit less CO_2 than

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petrol engines because diesel fuel has a higher energy density and the combustion process is more efficient. Diesel engines are also subject to special requirements, however, since fuel combustion takes place with excess air. The main constituent of air is nitrogen and this reacts with oxygen during combustion, thereby forming nitrogen oxides.

Ammonia is needed to reduce the nitrogen oxides produced in diesel engines. It is injected as an aqueous reducing agent (AdBlue) via a dosing module into the exhaust gas upstream of an SCR catalytic converter. Here, the solution evaporates; the reducing agent is split, combining with steam to form ammonia. In the SCR catalytic converter, the ammonia (NH_3) then reacts on a special coating with the nitrogen oxides (NO_x) to form water and harmless nitrogen (N_2) – the main constituent of the air we breathe.

In existing exhaust gas treatment systems, a close-coupled SCR catalyst is located between the turbocharger, the diesel oxidation catalytic converter – which converts uncombusted hydrocarbons – and the flexible connecting piece to the silencer pipe. The SCR coating is applied to the honeycomb structure of the diesel particulate filter, thereby enabling a single component to perform several functions. The close-coupled arrangement means that the exhaust gas temperatures required for high conversion rates can be achieved quickly after a cold start – the ideal range for conversion rates of more than 90 percent is between +220°C and +350°C. These conditions are met in many operating situations.

Conversion rates do not drop above +350°C – thanks to twin dosing-system. Temperatures at this level occur for example when driving at high speeds on the motorway, at high engine speeds over prolonged periods of time and when driving uphill, especially if the vehicle is fully loaded or towing a trailer.

[1)] Passat Variant 2.0 TDI Evo 110 kW / 150 PS (NEFZ) fuel consumption in l/100 km: urban 4,5 / extra-urban 3,6 / combined 4,0; CO_2-emissions combined in g/km: 104; efficiency class: A+ Passat Limousine 2.0 TDI Evo 110 kW / 150 PS (NEFZ) fuel consumption in l/100 km: urban 4,5 / extra-urban 3,5 / combined 3,9; CO_2-emissions in g/km: 101; efficiency class: A+

[2)] The vehicle has not yet gone on sale.

About the Volkswagen brand:

Volkswagen Passenger Cars operates in more than 150 markets worldwide and produces vehicles at more than 50 locations in 14 countries. In 2018, Volkswagen produced around 6.2 million vehicles, including bestsellers such as the Golf, Tiguan, Jetta and Passat. Volkswagen has a current workforce of 195,878 employees around the globe. Added to this are more than 10, 000 dealerships with 86,000 employees. Volkswagen is forging ahead consistently with the further development of automobile production. Electric mobility, smart mobility and digital transformation of the brand are the key strategic issues for the future.