

Euro 7

Pollutant standards for passenger cars and commercial vehicles

Executive Summary

Pollutant standards for passenger cars and commercial vehicles were first introduced in 1992 and several times updated since then. In November 2022, the European Commission proposed with Euro 7 a last update of exhaust emission limits, notably for nitrous oxide and particle numbers, and newly introduced limits for ammonia (for all vehicles) and nitrous oxide and methane (for heavy-duty vehicles). The new standards shall apply to passenger cars and light commercial vehicles from mid-2025 and for heavy-duty vehicles from mid-2027. Euro 7/VII is supposed to be the final regulatory stage for exhaust emissions. Brake particles and tire abrasion shall also be regulated, but concrete limits are so far only proposed for passenger cars and light commercial vehicles.

Main elements of the EU Commission's legislative proposal

Stricter exhaust emission limits:

The proposed limit values for passenger cars are largely based on the Euro 6 values for petrol vehicles. The removal of the measurement tolerances for on-road emission testing, wider test conditions and longer durability requirements result nevertheless in overall tighter pollutant rules.

For light commercial vehicles, the same limit values apply as for passenger cars. Only underpowered vehicles with a power to mass ratio <35 kW/t would get slightly higher limits.

Limit values for commercial vehicles >3,5 are significantly decreased compared to Euro VI, with stricter on-road test conditions.

Pollutant limits for brake and tyre particles:

For the very first time the EU's pollutant regulation shall include upper limits for brake dust and tyre wear. Limit values have been proposed so far only for brake particles (PM10) for passenger cars and light commercial vehicles. Limits for heavy-duty vehicles will follow in due time. The EU Commission opted to go step by step because measurement methods for non-exhaust particulates are fairly new and not yet sufficiently field-tested.

Adaptation of on-road tests to better reflect real driving:

The EU Commission wants to further adapt the on-road (RDE¹) test regime in order to better reflect real driving conditions in Europe (temperature, altitude etc.) and to measure the vehicle's performance also on short trips which impact air quality especially in urban areas. The test conditions for RDE tests are not yet conclusively defined in the legislative draft nor is extreme/ "biased" driving. Some parameters are fixed in the Euro 7 regulation, but most of the details will be laid down in an implementing regulation, to be drafted by the EU Commission in the coming months.

For gaseous pollutants, PM and PN of heavy-duty vehicles, engine testing is to be replaced by on-road tests.

On-board measurements of pollutants:

In the future, vehicles have to be equipped with an on-board-monitoring (OBM) system to monitor the emission performance of vehicles during their lifetime. The data shall be reported over the air, for monitoring purposes, but also to facilitate technical inspections. OBM shall also warn the driver in case of significant pollutant limit exceedance and trigger repair.

Battery performance standards for electric vehicles:

In view of an increasingly electrified fleet, the EU Commission requires a minimum performance of batteries in electric and hybrid cars and vans. For cars, batteries must keep 80% of their initial performance in the first five years of the vehicle lifetime respectively during the first 100 000 km (light commercial vehicles 75%) and 70% up to eight years or 160 000 km (light commercial vehicles 65%).

Longer durability lifetime:

Passenger cars and light commercial vehicles shall comply with new limits for a lifetime of 200 000 km or 10 years, whatever comes first. For the last 40 000 km / 2 years, higher limits apply.

Heavier commercial vehicles (N2, N3<16t, M3<7.5t) shall have a durability lifetime of 300 000 km/ 8 years and heavy-duty vehicles 700 000 km / 15 years. For an additional lifetime up to 75 000 km, and 175 000 km for heavy-duty vehicles, higher limits apply.

Bosch Key Political Messages

- **Bosch welcomes Euro 7 as an important last step to regulate exhaust emissions.** The proposed Euro 7 standards can further reduce the impact of new vehicles (and beyond 2035 for vehicles in use) on air quality.
- It is **consistent** that the EU-Commission proposes **moderate exhaust emission limits for passenger cars** because of the phase-out of new ICEs by 2035. The **stringency** of the proposed exhaust pollutant limits nevertheless **increases** for all vehicle segments which Bosch regards as necessary in

¹ RDE = Real Driving Emissions

order to contribute to the achievement of increasingly stringent EU's ambient air quality targets, especially in densely populated urban areas. Today's average lifetime for passenger cars is 12 years and trucks around 14 years. This means they will be in the market beyond 2045; and will thus have a long-term impact on air quality.

- The proposed pollutant limits will be more challenging for light commercial vehicles. The limit values are the same as for passenger cars while a higher vehicle performance is required. The **threshold for underpowered vehicles** - which entitles them to slightly higher limit values – **should be raised** to 40 kW/t to more adequately reflect the light commercial vehicles in the market.
- For **heavy duty vehicles**, the proposed **limit values are demanding** and associated with higher costs than estimated by the EU Commission.
- Given the rapidly growing share of electric vehicles, it is reasonable to also set limit values for **particle emissions from brakes** and tyres. Bigger and therefore heavier vans should get higher limits for particle emissions as they don't have the same technological means to reduce brake dust. Altogether, a previous monitoring period is advisable to test new measurement methods.
- **Bosch strongly supports** an adaptation of the **RDE test regime to better reflect real-world driving conditions**. The abolishment of the trip composition 'urban-rural-motorway' and shortening of test distance in RDE tests in particular allows a better coverage of urban driving conditions. For heavy-duty vehicles, the lower power threshold for trucks and buses permits a better consideration of low load and low speed driving in RDE tests which occurs mainly in cities.
- The **RDE test conditions** in Euro 7 **require further clarification**. The criteria for extended driving (challenging driving situations, for which tests are still considered valid but higher pollutant limits apply) must be further defined. Test situations which are no longer representative for real on-road driving in Europe (biased driving), must be reliably excluded. Otherwise compliance with Euro7 can only be ensured at very high development costs, if at all. Clear rules are necessary for manufacturers, suppliers and homologation authorities and inspection/testing services alike.
- New pollutant standards should **apply to new types of passenger cars and light commercial vehicles from mid-2026**. An early implementation of new pollutant limits is crucial in view of considerably stricter ambient air quality standards that EU Member States and European cities will have to respect from 2030. The application date for all new vehicle registrations should be one year later to avoid tensions in the market. An application of Euro 7 rules already from July 2025, as proposed by the EU Commission, is not manageable for OEMs, suppliers, technical service companies or homologation authorities. An application of Euro 7 even from 2026, as stated above, requires that the EU Commission aims for pragmatic and best feasible solutions in the Implementing Regulations (e.g. for OBM; RDE test conditions). The new rules should apply to heavy-duty vehicles (new types) from mid-2027 as pollutant standards are more stringent. Any change in the ambition of the Euro 7 proposal must result in an adaptation of the implementation time.
- **OBM-systems** can bring important benefits by contributing to identifying malfunctions, tampering, degradation and providing data for fleet monitoring and vehicle selection for In-Service-Conformity checks. The OBM system should be designed to detect high exhaust emission exceedances for NO_x, NH₃ and PM and to monitor NO_x & NH₃ as sum value with available sensor technologies. A reasonable

margin must be set to define significant emission exceedances and to reflect measurement capabilities and tolerances of in-vehicle-measurement technologies.

Contact details:

Political Affairs and Government Relations (abteilungsbriefkasten.ccga@de.bosch.com)