

EPA Sets Tier 3 Tailpipe and Evaporative Emission and Vehicle Fuel Standards

The U.S. Environmental Protection Agency (EPA) is finalizing an important rule designed to reduce air pollution from passenger cars and trucks. Starting in 2017, Tier 3 sets new vehicle emissions standards and lowers the sulfur content of gasoline, considering the vehicle and its fuel as an integrated system. The vehicle standards reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will make emission control systems more effective for both existing and new vehicles, and will enable more stringent vehicle emissions standards since removing sulfur allows the vehicle's catalyst to work more efficiently. The Tier 3 standards are closely coordinated with California's LEV III standards as well as with EPA's and California's programs for greenhouse gas (GHG) emissions from light-duty vehicles. EPA is setting these Tier 3 standards to address public health issues that exist currently and are projected to continue in the future. EPA's action was requested in a May 21, 2010 Presidential memorandum.

The Tier 3 program continues the successful transition that began with EPA's Tier 2 program, finalized in 2000, in which EPA treated vehicles and fuels as a system to reduce both gasoline sulfur and vehicle emissions. While there were claims at the time that the program would cause fuel prices to increase far in excess of EPA's estimates and would result in closures and fuel supply shortages, the Tier 2 program was a success; it resulted in gasoline sulfur reductions of up to 90 percent and enabled the use of new emission control technologies in cars and trucks with no serious negative impacts on the refining industry. EPA's Clean Diesel Program similarly utilized a systems approach to reducing sulfur emissions from diesel fuels and enabling cleaner diesel technologies with the Highway Diesel Rule (finalized in 2001) and the Non-road Diesel Rule (finalized in 2004), again with no serious negative impacts. Now that the U.S. refining industry routinely produces lower sulfur fuel products, new market opportunities for international fuel exports have opened up.

EPA is finalizing the Tier 3 program largely as proposed. EPA received a large number and wide range of comments on the proposed rule, and the final Tier 3 program is based both on this extensive public input and updated analyses of the rule's impacts. EPA sought comment on the level of the per-gallon sulfur cap (which applies in addition to the annual average), and has decided to maintain the per-gallon caps at existing levels. EPA is also finalizing an ethanol content of 10 percent (E10) for emissions test gasoline (as opposed to the proposed 15 percent ethanol (E15) test fuel).

Tailpipe Emissions Standards

EPA is setting new tailpipe standards for the sum of non-methane organic gases (NMOG) and nitrogen oxides (NOX), presented as NMOG+NOX, and for particular matter (PM) that apply to all light-duty vehicles and some heavy-duty vehicles. Compared to current standards, the NMOG and NOX tailpipe standards for light-duty vehicles represent approximately an 80% reduction from today's fleet average and a 70% reduction in per-vehicle PM standards. Heavy-duty tailpipe standards represent about a 60% reduction in both fleet average NMOG+NOX and per-vehicle PM standards. EPA is also extending the regulatory useful life period during which the standards apply from 120,000 miles to 150,000 miles.

The tailpipe standards include different phase-in schedules that vary by vehicle class, but generally phase in between model years 2017 and 2025. In addition to the gradual phase-in schedules, several other provisions are designed to further ease manufacturers' paths to compliance with the stringent new standards. Depending on the standards and the vehicle class, these flexibility provisions include credits for early compliance and the ability to offset some higher-emitting vehicles with extra-clean models. EPA is also finalizing more lead time for small businesses and small volume manufactures as well as a hardship provision that allows for additional time to comply if a manufacturer cannot meet requirements after a good faith effort and would face severe economic hardship without the additional lead time.

NMOG+NOX Standards: The standards for NMOG+NOX are fleet-average standards, meaning that a manufacturer calculates the weighted average emissions of the vehicles it produces in each model year and compares that average to the applicable standard for that model year. The standards differ by vehicle class and test cycle. Key elements include:

- NMOG+NOX Standards for Light-Duty Vehicles and Light-Duty Trucks (vehicles below 8,500 pounds (lbs) Gross Vehicle Weight Rating (GVWR)), and Medium-Duty Passenger Vehicles (8,500 to 10,000 lbs GVWR):
 - As measured on the Federal Test Procedure (FTP), the standards decline from today's fleet average of 160 milligrams per mile (mg/mi) to 30 mg/mi by 2025.
 - As measured on the Supplemental Federal Test Procedure (SFTP), the standards decline from today's fleet average of about 200 mg/mi to 50 mg/mi by 2025.
- NMOG+NOX Standards for Heavy-Duty Pick-ups and Vans; Class 2b (8,501-10,000 lbs GVWR) and Class 3(10,001-14,000GVWR)):

- As measured on the FTP, the fleet average standards decline from today's fleet average of 395 mg/mi to 178 mg/mi for Class 2b vehicles and 630 mg/mi to 247 mg/mi for Class 3 vehicles by 2022.
- Additional standards for emissions measured over a heavy-duty SFTP are being set for the first time and vary by vehicle class and power-to-weight ratio.

PM Standards: The PM standards are expressed on a per-vehicle basis, meaning the standards apply to each vehicle separately (i.e., not as a fleet average). EPA is setting PM standards that differ by vehicle class and test cycle. Key elements include:

- **PM Standards for Light-Duty Vehicles, Light-Duty Trucks, and Medium-Duty Passenger Vehicles:**
 - As measured on the FTP, the per-vehicle standard is 3 mg/mi for all vehicles and for all model years, as compared to today's standard of 10 mg/mi.
 - As measured on the US06, a high-speed, fast-acceleration component of the SFTP, the standard for all light-duty vehicles is 10 mg/mi through MY 2018 and 6 mg/mi for 2019 and later model years. These standards are lower than what was proposed based on more recent data supporting a numerically lower US06 PM standard.
- **PM Standards for Heavy-Duty Pick-ups and Vans; Class 2b and 3:**
 - As measured on the FTP, the per-vehicle PM standards are 8 mg/mi for Class 2b vehicles and 10 mg/mi for Class 3 vehicles.
 - EPA is also setting PM standards for emissions measured over the SFTP with standards levels and duty cycles varying by vehicle class and power-to-weight ratio.

Evaporative Emission Standards

EPA is setting more stringent standards designed to eliminate fuel vapor-related evaporative emissions and improve durability. The evaporative emissions program represents about a 50 percent reduction from current standards and applies to all light-duty and onroad gasoline-powered heavy-duty vehicles. As with the tailpipe standards, the evaporative emissions standards include phase-in flexibilities, credit and allowance programs, and more lead time and a hardship provision for small businesses and small volume manufacturers. EPA is also extending the regulatory useful life period during which the standards apply from 120,000 miles to 150,000 miles. Key elements of the program include:

- **Evaporative Emissions Standards:** The final standards over 2-day and 3-day evaporative emission tests vary by vehicle categories and range from 0.300 g/test to 0.500 for light-duty vehicles and medium duty passenger vehicles, with 0.600 g/test for onroad gasoline-powered heavy-duty vehicles.

- **Bleed Test Requirements:** EPA is setting a new testing requirement referred to as the bleed emission test. The bleed emissions test standard for light-duty and medium-duty passenger vehicles is 0.020 g/test without averaging. The standard for onroad gasoline-powered heavy-duty vehicles is 0.030 g/test without averaging.
- **Leak Test and Emission Standard:** EPA is finalizing a new emission standard and test procedure requiring that the cumulative equivalent diameter of any orifices or “leaks” not exceed 0.02 inches anywhere in the fuel/evaporative system for light-duty vehicles, medium-duty passenger vehicles, and some gasoline-powered heavy-duty vehicles.
- **Onboard Diagnostic System (OBD) Requirements:** EPA is adopting and incorporating by reference the California Air Resources Board’s (CARB) current OBD regulations, effective for MY 2017, with only minor differences. These requirements cover all vehicles except those in the heavier fraction of the heavy-duty vehicle class.

Fuel Standards

EPA is finalizing gasoline sulfur reductions that are critical to enabling manufacturers to comply across the fleet with the stringent vehicle standards. The gasoline sulfur standards will also achieve significant immediate benefits by reducing emissions from existing vehicles. Under the final Tier 3 program, federal gasoline will be required to meet an annual average standard of 10 parts per million (ppm) of sulfur by January 1, 2017. EPA is also finalizing standards that maintain the current 80 ppm refinery gate and 95 ppm downstream cap. The Tier 3 gasoline sulfur standards are similar to levels already being achieved in California, Europe, Japan, South Korea, and several other countries.

For the gasoline sulfur standards, EPA is finalizing averaging, banking, and trading (ABT) program that allows refiners and importers to spread out their investments through an early credit program and rely on ongoing nationwide averaging to meet the 10 ppm sulfur standard. New to the final rule, EPA is including the ability to carry over credits from Tier 2 to Tier 3 in the ABT program. EPA is also finalizing a three-year delay for small refiners and small volume refineries processing 75,000 barrels of crude oil per day or less, as well as other flexibilities for refiners such as hardship provisions for extenuating circumstances.

Emissions Test Fuel

EPA is updating the federal emissions test fuel to better match today’s in-use gasoline and also to be forward-looking with respect to future ethanol and sulfur content. The new test fuel specifications apply to new vehicle certification, assembly line, and in-use testing. EPA is transitioning to the new test fuel during the first few years that the Tier 3 tailpipe and evaporative standards are phasing in. Key changes include moving to a test fuel containing 10 percent ethanol by volume, lowering octane, and lowering the existing sulfur specification to be consistent with Tier 3 requirements. EPA is also setting test fuel specifications for E85 for the first time.

Public Participation

This final rule is based on extensive public input received in response to the Tier 3 proposal. EPA held two public hearings in Philadelphia and Chicago, and we received more than 200,000 public comments. A broad range of stakeholders provided comments, including state and local governments, auto manufacturers, emissions control suppliers, refiners, fuel distributors and others in the petroleum industry, renewable fuels providers, environmental organizations, consumer groups, labor groups, private citizens, and others. EPA has also had extensive outreach with key stakeholders throughout the development of this rule.

For More Information

You can access the final rule and related documents on EPA's Office of Transportation and Air Quality (OTAQ) Web site at:

www.epa.gov/otaq/tier3.htm

For more information on this rule, please contact the U.S. Environmental Protection Agency, Office of Transportation and Air Quality at:

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