



Increasing the Ethanol Content in Fuel

More Bioethanol in Petrol (E10)



Going from E5 to E10: The current ethanol content of max. 5% by volume does not pose any problems for any type of vehicle. But the EU wants the ethanol content to increase to 10% by volume by the end of 2010. In Germany, this requirement should have been implemented starting in 2009. ADAC mounted a campaign when it became apparent that the number of vehicles incompatible with the new fuel standard was much higher than assumed originally. Many motorists would have had to switch to the much more expensive Premium 98 which remains available unaltered.

In France, the new fuel is already on sale at pumps. We recommend that travellers consult our listing of vehicles cleared for E10 by the manufacturers (see below).

E10: what it is all about

The issue is reducing CO₂ emissions resulting from the combustion of fossil fuel (e.g. petroleum). One of the alternatives is the use of renewable energy sources, e.g. grains for fuel. Biofuels absorb as much CO₂ while growing as they generate in combustion (e.g. in an engine). This means that they have a neutral CO₂ balance. But since the cultivation and refining processes also chiefly consume fossil energy, the CO₂ circuit is not completely closed. Differing points of view are responsible for an ongoing debate over the issue of the CO₂ balance.

In principle, ADAC welcomes the use of biofuels, provided that they do not harm the environment and that their production is ecologically responsible. First and foremost it must be ensured that the CO₂ balance is in fact positive from cultivation to combustion. Furthermore, the use of biofuels must not come at the expense of food production. And finally, the introduction of such fuels should be subsidised in order to ensure that it is cost-neutral for motorists.

In Germany, bioethanol was scheduled to be blended with Regular and Premium 95 fuels at a rate of max. 10% (hence E10) from 2009. The problem is that several million vehicles are not cleared by their manufacturers and would not have been E10 compatible. Their owners would have been required to switch to the more expensive Premium 98 – since only this grade will continue to be available with the “harmless” rate of max. 5% by volume of bioethanol (E5). Considering the explosion of costs, notably for automotive fuel, ADAC found this unacceptable. In addition, according to car manufacturers, E10 involves an approx. 3% drop in fuel efficiency due to the lower calorific value of the ethanol component.

EU requirement: E10 must be introduced

But still, all EU Member States must raise the maximal ethanol rate in automotive petrol from currently 5% by volume (E5) to 10% by volume (E10) by the end of 2010. The new requirement was established in EU Directive 2009/30/EC of 23 April 2009 amending the EU Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil. On the strength of the ADAC anti-E10 initiative, the Federal Environment Minister, Mr Gabriel, opposed the E10 legislation in Brussels but failing to raise support from other countries, he succeeded only in securing a provision ensuring the availability of fuel for older vehicles not compatible with E10.

Under this provision, Member States must require fuel providers to offer unproblematic E5 petrol at least until 2013. If required they may even extend this period. Furthermore, the Member States must ensure that the consumers are adequately informed regarding the biofuel share in petrol and on the safe use of this fuel.

The reason is that manufacturers have not yet cleared all older vehicles for the use of high-bioethanol fuels. For a transitional period, the adequate type of fuel must be available for these vehicles.

It is up to the Member States to decide how to implement this requirement. The EU simply requires them to ensure “continued supply” and the “appropriate geographical coverage”.

ADAC now focuses on the implementation of the EU Directive into national law. It must be achieved by the end of 2010. In Germany, this requires an amendment to the 10th Ordinance Implementing the Federal Immissions Control Act (10 BImSchV).

ADAC expects a consumer-friendly transposition of the above provision, specifically that E5 petrol should remain available nation-wide at affordable rates for motorists who cannot fill up with E10. ADAC will monitor this issue in close contact with the competent Federal Ministry of the Environment.

Not every vehicle is E10 compatible

E10 is not for every car: damage may result in vehicles whose engine and fuel system components are not E10 compatible.

The main problem caused by a 10% ethanol-petrol blend is corrosion in aluminium components (ethanol oxide corrosion). Particularly at high levels of pressure and temperature, E10 can form alcoxides which may corrode aluminium. The problem is exacerbated by the fact that the first tankful of E10 can initiate unstoppable corrosion. Leaks in the fuel system caused by corrosion are a serious safety risk.

This is compounded by masked problems due to ethanol’s capability of dissolving anorganic compounds, leading to raised metal concentrations in fuel. Also, here is no hard data regarding the compatibility of sealing materials and hosiery in the fuel system. It is therefore obvious that the E10 biofuel can only be used in models expressly cleared for this type of fuel by the manufacturers.

Vehicles cleared for E10 by manufacturers / situation in France

Since France as the first EU country introduced E10 in April 2009 at least across some regions with the pump designation **SP95 E10**, some manufacturers have revised their clearances. Please find below a current overview based on manufacturer and importer information received upon request.

Make	Cleared
Alfa	<ul style="list-style-type: none"> - MiTo - 159: 1.8 16V, 1.8 TBi 16V, 3.2 JTS V6 - Brera: 1.8 TBi 16V, 3.2 JTS V6 - Spider: 1.8 TBi 16V, 3.2 JTS V6 - 8C: 4.7 32V
Audi	All models except <ul style="list-style-type: none"> - Audi A2 1.6 FSI, MY 2002 to 2006 - Audi A3 1.6 FSI, MY 2001 to 2004 - Audi A3 2.0 FSI, MY 2001 to 2004 - Audi A4 2.0 FSI, MY 2001 to 2004 - Audi A4 petrol engine models with standard parking heater, years of make 2000 to 2007: only seasonally when using the parking heater
BMW, MINI Rolls-Royce	<ul style="list-style-type: none"> - all BMW all years of make, unless the owner’s manual specifies the use of Premium 98 fuel only - all MINI after the make’s relaunch in 2000 - all Rolls-Royces from 2003 (launch of the current Phantom model)
Cadillac, Corvette, Hummer	All models
Chevrolet (excl. Daewoo)	<ul style="list-style-type: none"> - Cruze - HHR
Citroën	All vehicles made after 1 January 2000.

Chrysler, Dodge, Jeep	All models starting MY 1989.
Dacia	All models since the introduction of the Dacia Logan in Europe
Daihatsu	<ul style="list-style-type: none"> - Cuore L276: from date of manufacture 25 April 2008 - Trevis L651: from date of manufacture 8 May 2008 - Sirion M3#: from launch into production - Materia M4#: from Launch into production - Terios J2#: from launch into production - Copen L881: from date of manufacture 25 April 2008 - YRV M2#: from 2005 production
Fiat	<p>All emission levels Euro3, Euro4 + Euro5 models starting year of make 2000 except:</p> <ul style="list-style-type: none"> - Barchetta: 1.8 16V - Bravo/Brava (182): 1.6 16V - Doblò: 1.6 16V - Marea: 1.6 16V, 2.0 16V - Multipla: 1.6 16V - Palio: 1.6 16V - Punto (188): 1.8 16V - Stilo: 1.6 16V (1,596ccm), 1.8 16V, 2.4 20V
Ford	<p>All models except:</p> <ul style="list-style-type: none"> - Mondeo SCi (direct injection petrol, 96kW), years of make 2004 to 2006
Honda	All fuel-injection models.
Hyundai	All models starting MY 1992.
Jaguar	All models starting MY 1992.
Kia	All models
Lada	Under investigation
Lancia	<p>All emission levels Euro3, Euro4 + Euro5 models from years of make 2000 except:</p> <ul style="list-style-type: none"> - Lybra: 1.6 16V, 1.8 16V, 2.0 20V - Thesis: 2.0 Turbo 20V, 2.4 20V, 3.0 V6 24V, 3.2 V6 24V
Land Rover	All models starting MY 1996.
Mazda	<p>All new-generation models from 2002 (incl. direct injection petrol) from the launch of the Mazda 6; applies to the following models:</p> <ul style="list-style-type: none"> - Mazda 2: starting year of make 2007 - Mazda 2: years of make 2003 to 2007; Valencia plant - Mazda 3 + Mazda 3 MPS: starting year of make 2003 - Mazda 5: starting year of make 2005 - Mazda 6 + Mazda 6 MPS: starting year of make 2002 - Mazda MX-5: starting year of make 2005 - Mazda CX-7: starting year of make 2007 - Mazda RX-8: starting year of make 2003 <p>Older models still under investigation.</p>
Mercedes, Smart	<p>All Mercedes-Benz + Smart except:</p> <ul style="list-style-type: none"> - all factory-produced vehicles without 3-way catalytic converter or equipped with a carburettor (usually older than 23 years) - Vehicles whose owner's manuals specify the use of Premium 98 fuel only - 1st generation of 4-cylinder direct injection petrol engines (C 200 CGI – 203 + CLK 200 CGI – 209 from years of make 2002 to 2005), which had to use Premium 98 fuel anyway <p>More information relative to E10-incompatible models at www.mercedes-benz.de in the <i>Mercedes-Welt > Aktuelles > Biogene Kraftstoffe</i> tab.</p>
Mitsubishi	<p>All models except</p> <ul style="list-style-type: none"> - vehicles with GDI direct injection petrol engines

Nissan	<ul style="list-style-type: none"> - Micra: starting year of make 2000 - Note: starting year of make 2006 - Almera: starting year of make 2000 - Tiida: starting year of make 2007 - Almera Tino: starting year of make 2000 - Qashqai: starting year of make 2007 - Primera: starting year of make 2000 - X-Trail: starting year of make 2001 - Terrano II: starting year of make 2000 - Pathfinder: from Years of make 2000 - Murano: starting year of make 2005 - Pick-Up (D22): starting year of make 2000
Opel	All models except <ul style="list-style-type: none"> - vehicles with the 2.2l direct injection petrol engine (motor code: Z22YH): Signum, Vectra, Zafira
Peugeot	All vehicles made after 1 January 2000.
Porsche	All models starting year of make 1996.
Renault	All models starting year of make 2000 except: <ul style="list-style-type: none"> - vehicles the 2.0l direct injection petrol engines (2.0 16V/F4R) + 2.0l turbo-charged petrol engine (F4Rt) from years of make 2000 to 2002
Rover (excluding Land Rover)	No data available since manufacturer is no longer on the market. We recommend refraining from the use E10 fuels.
Saab	All models
Seat	<ul style="list-style-type: none"> - Arosa (6H1): MY 1997 to 2004 - Ibiza IV (6L1): starting MY 2002 - Cordoba II (6L2): starting MY 2003 - Leon I (1M1): MY 1999 to 2006 - Leon II (1P1): starting MY 2006 - Toledo II (1M2): MY 1999 to 2004 - Toledo III (5P2): starting MY 2005, except 2.0 FSI (engine code BLR, 110kW) to month of make 06/2004 - Altea, Altea XL, Altea Freetrack (5P1, 5P5): starting MY 2004, except 2.0 FSI (engine code BLR, 110 kW) to month of make 06/2004 - Alhambra (7V9), starting MY 2001
Skoda	All models regardless of MY except: <ul style="list-style-type: none"> - models whose owner's manuals specify the use of Premium 98 fuel only - Felicia with the 40 or 50kW 1.3l OHV engine, years of make 1994 to 2001 (parts of the fuel pressure regulator must be replaced to be compatible with E10 fuel) - previous models (Forman, Favorit etc.)
Subaru	All models from year of make 1991.
Suzuki	All current models; for older models, please follow owner's manual instructions.
Toyota	All models from month of make 01/1998.
Volvo	All models, starting with the Volvo 740, provided that: <ul style="list-style-type: none"> - the Volvo specified motor oil is used during the whole life-cycle - maintenance in line with Volvo maintenance specifications can be documented for the entire life-cycle Applies to 740, 940, 960, 850, S40, S60, S80, S90, V40, V50, V70, V70 XC, V90, XC60, XC70, XC90, C30 + C70 in all available petrol engine versions.
Volkswagen	All models except <ul style="list-style-type: none"> - vehicles with 1st generation FSI engines: Lupo, Polo, Golf, Bora and Touran, Years of make 2000 to 2004, in some cases to 2006

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Cleared motorcycles

As of now, motorcycle manufacturers have cleared only a small number of bikes.

Make	Cleared
BMW / Husqvarna	All models
Buell, Harley-Davidson	<ul style="list-style-type: none">- all standard Harley-Davidson engines starting MY 1980- for Harley-Davidson bikes built and/or modified before MY 1980 and/or tuned high-output Harley-Davidson engines as well as for all Buell models we recommend switching to ROZ 98 fuel.
Ducati	Under investigation
Honda	<ul style="list-style-type: none">- all emission level Euro3 Honda two-wheelers- owner's manual specifications apply to Euro2 bikes or older built after 1990- bikes older than 1988 under investigation; results please see www.honda.de
Kawasaki	<ul style="list-style-type: none">- fuelling with E10 is not altogether prohibited; however, it is recommended to use fuels with lower Ethanol levels- reasoning: E10 can interfere with the performance of an engine (e.g. liveliness, smoothness) and may cause the following problems: rough idle, poor low-rev response, engine rattle. When the above symptoms are manifested, use fuels with lower Ethanol levels or switch to ROZ 98 fuel.
KTM	<ul style="list-style-type: none">- all models since MY 2000- for older models (pre MY 2000) fuels with more than 5% per volume of Ethanol (> E5) should not be used
Triumph	<ul style="list-style-type: none">- all Hinckley era models since year of make 1990
Yamaha	<ul style="list-style-type: none">- all models over 50ccm starting MY 2010- Euro3 emission level bikes under investigation- for Euro2 emission level bikes and older and models up to 50ccm, it is recommended to switch to ROZ 98.

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E 50 and E 85?

The E10 petrol has no relation to other ethanol blends such as E50 or E85. The latter are only destined for Flexible Fuel Vehicles (FFV) which are being offered by some manufacturers and which are engineered for this type of fuel. They can be recognised by their model designations and will be fueled at special pumps.