

If a car works with today's regular E5 petrol from Irish petrol stations it will work with new E10

Every petrol engine ever made or sold in the USA runs on E10 petrol. E10 has been the standard fuel there for close to 40 years and there hasn't been a single incident of a claim relating to it¹. E10 is where ethanol is blended into traditional petrol at 10% in order to cut climate harming carbon emissions, cut particulates emissions, increase petrol performance and quality, reduce dependency on oil imports and give a boost to the farming sector. Ireland has already been using petrol with 5% ethanol (E5) exclusively for some years. In Brazil cars run on either 27% or 100% ethanol while E10 is now the dominant blend in France, Belgium, Bulgaria and Finland. Around half a billion cars - a quarter of planet Earth's entire fleet - are operating trouble-free in regions where E10 is standard.

So what's at issue? Ireland is considering a transition from E5 to E10 before 2020 for all petrol, as part of its climate action programme. In the process it is looking at a widely-referenced 2010 document by ACEA, the association of the European motor industry, in which car makers list² vehicle models that may or may not be treated as being cleared for E10, prompting fuel distributors to worry that they might be found liable if something ever went wrong. But all the evidence indicates that nothing will go wrong.

Two thirds of the car makers in the ACEA document provide an "old before" date indicating when cars they made are too old to be expressly cleared or not cleared for E10. These amount to around 5% of Ireland's petrol engine fleet. BMW, Volkswagen, Hyundai and all American makers are among those that give the thumbs up for all their cars not matter how old and indeed as far back as May 1979, Chrysler, AMC, and General Motors announced that use of 10% ethanol would have no effect on vehicle warranties.

E10 and ageism don't mix. If you view E10 use in North America in its 250 million cars, over a 20 year period, as a massive real world experiment it can be concluded beyond doubt that being old is not a factor for exclusion. Being old is actually a factor for inclusion, as this great American "experiment" amounts to conclusive evidence that E10 is 100% safe in older vehicles.



[Photo: California Mercedes Benz owners event 2011](#)

A third of car makers in the ACEA document indicate certain engine types – typically in models which are 10 to 20 years old - which are expressly not cleared for E10, and these could amount to several hundred cars in the current Irish petrol fleet. Explanations as to why clearance is withheld are not given. However the only material used in 10-20 year old cars with potential to exhibit E10 compatibility limitations is polyurethane.

¹ A BrownWinick review of litigation cases shows no cases found of warranty claims denied because gasohol/E10 was used

² ["List of ACEA member company petrol vehicles compatible with using 'E10' petrol \(2010, last updated 2018\)"](#)

All metals, plastics and polymers³ used in engines (i.e. HDPE, PTFE, NBR, POM, AEM, CPE, CSPE, HNBR, FKM and TPV), with the exception polyurethane, are deemed suitable for application with E10.

Polyurethane is used commonly in mounting brackets and adhesives in machinery, but it is less likely to be found in components coming in contact with the fuel. In any case, a detailed assessment of usage scenarios is not actually necessary because polyurethane was used in car engines sold in North America up to the mid 1990s⁴ to the same extent it was used in European cars. The same conclusion can be drawn as can be drawn about old cars generally: No car with polyurethane parts has ever been known to exhibit problems resulting from E10. Nor are there any known laboratory or bench tests which have shown up issues arising from E10. Indeed when tests are done to investigate the effects of higher ethanol blend fuels (E15 up) on older vehicles in the USA, E10 is used as the control fuel, i.e. the blend known for sure to be safe. E10 is also Europe's official standard test fuel.

Cleared for E10: Summary of exceptions and "old before" dates (ACEA)

Maker	Engine exceptions	"Old before" date
BMW		
Mini		2000
Rolls Royce		2003
Mercedes Benz	C200/CLK200 CGI 2002-5	1986 ⁵
Smart		
Alfa Romeo		2011
Fiat/Lancia	Certain 16/20/24/32 valve	2000
Chrysler/Dodge/Jeep		
Ford	1.8SCI Mondeo 2003-7	1992
Jaguar		1992
Land Rover		1996
Honda		1980s ⁶
Hyundai/Kia		
Peugeot/Citroën/DS		2000
Opel/Vauxhall	2.2 injection with code Z22YH	
GM-Cadillac/Corvette/Hummer		
GM-Chevrolet		2006
Renault/Dacia	Certain 2.0 F4R/F5R 7xx inj./turbo	2002
Toyota	Certain 1AZ-FSE/2AZ-FSE	1998
Lexus	Certain 3GR/4GR/1UR-FSE	1998
Volkswagen/Audi/SEAT	Certain FSI 2001-6	
Porsche	Carrera GT 2004-7	1998
SKODA	Felicia 1.3 OHV	
Volvo	Type 1.8 GDI mid '90s	1976
Daihatsu		2008
Nissan		2000
Mazda		2002
Mitsubishi	GDI to 2007	
Subaru		1991
Suzuki	See owner's manual	

Source: ACEA

Ethanol's use as a motor fuel dates back to the early 1900s, when engine components were made of iron, rubber, cork and paper. The very first gallons of ethanol used as a motor fuel were procured by Henry Ford, back in 1908. Engine materials have evolved greatly since then and E10 has come in and out of use across the world, in times of crisis or fuel shortage, with Ireland being no exception.

In 1978 the USA's Environmental Protection Agency approved the introduction of E10. The data submitted for the approval process demonstrated that vehicles would operate on E10 without harm from an emissions

³ Jones B., Mead G., Steevens P. (2011a). The effects of E20 on plastic automotive fuel system components AND The effects of E20 on elastomers used in automotive fuel system components, Minnesota Center for Automotive Research, Minnesota State University, Mankato, Minnesota. Emissions 2011, Proceedings Volume 62, Ann Arbor, Michigan, USA, June 2011.

⁴ <https://www.nrel.gov/docs/fy12osti/53606.pdf> (page 2)

⁵ 25 years prior to 2011

⁶ Introduction of PGM-FI engine

standpoint, with no loss in vehicle performance and importantly, with no impact on vehicle safety. Subsequently, in 1984, the Coordination Research Council (American Petroleum Institute, Chrysler, Daimler, Ford, General Motors, Honda, Mitsubishi, Nissan, Toyota, and Volkswagen) studied the impact of ethanol fuel blends on drivability under cold and warm start-up conditions, and they found no cause for concern. The Council has conducted many positive ethanol test programmes since then. The Society of Automotive Engineers has published studies⁷ on ethanol dating back to the 1950s that effectively investigate the “lack” of negative effects of E10 on vehicles. There has been dedicated research for car collectors to investigate the possibility of long-term effects on vintage vehicles of ethanol blended petrol. From 2006-8, collector car and boat insurance agency, Hagerty Insurance, together with the Kettering University Advanced Engine Research Laboratory conducted a comprehensive study⁸ to address that concern. The research determined that there was no difference in performance between carburetor engines running E10 and those with more modern direct injection systems. A paper from the U.S. Army published in 1981 showed no adverse effects from ethanol use. E10 is the prevalent blend in Finland and in the event a driver fills up with E10 and is concerned about engine compatibility, the official advice there is “don’t worry, carry on”. Bulgaria’s petrol cars all run on 8% ethanol or higher, with no issues reported. The International Council on Clean Transportation, in its 2014 report on Technical Barriers to Consumption of Higher Blends of Ethanol⁹, treats E10 as the baseline safe blend for all engines. In 2012 Germany’s all-important motoring organisation ADAC carried out a search¹⁰ for examples of E10 compatibility incidents in Germany and found none. In 2012 European oil company association CONCAWE (and partner to Fuels Europe) carried out vehicle testing¹¹ on E10 and found that all its test vehicles completed the test cycles with no false starts, no misfires, no stalls, no failures, and no faults recorded by the On-Board Diagnostics systems.

In 2012 the USA approved the use of E15 fuel in all cars made from 2001 onwards. E15 acceptance is expected to extend backwards in time as empirical evidence builds. The process of controlled testing the pre-2001 fleet, model-by-model, is simply too complicated as it is typically impossible to correlate a symptom with a particular cause in a vehicle with a hundred thousand miles or more on the clock.

The discussion about E10 introduction in Ireland in some commentators’ minds boils down to one thing only: the prospect of a driver cleverly managing to convince a judge in court that an engine issue they have experienced was somehow the result of E10 incompatibility. There are no technical or logical means by which such a claim could be substantiated. Ireland’s climate programmes should not be hampered by fear of a fraudulent claim attempt.

No one can blame ACEA members for taking a conservative stance on the introduction of new fuel blends, so it is up to society as a whole to consider all the factors and to make a judgement on whether or not to move forward, in partnership with the car makers and fuel suppliers who are so important to modern transport. North America made that judgement call in 2000 and continues each year to make the same call again, on the basis that there have been no detrimental effects from the use of ethanol in transportation.

In terms of renewable energy, introducing E10 is the equivalent to taking about 70,000 of Ireland’s cars off fossil fuel and cutting fossil carbon emissions by 150 ktCO₂. It cuts petrol car particulates emissions by around 20%¹², will reduce Ireland’s exposure to fines by €25 million for not reaching EU renewable energy targets and help mitigate the reduction in EU double-counting allowances for biodiesel made with used cooking oil. Conventional European ethanol in E10 adds no cost to the consumer (in fact ethanol is a much lower cost carbon abatement measure than electricity) and it comes with no adverse impacts on land use or the environment.

Now is the right time for Ireland to move to E10.

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⁷ <https://www.sae.org/publications/technical-papers/content/811199/>

⁸ <https://www.hagerty.com/articles-videos/articles/2009/03/02/ethanol-demonic-or-devine>

⁹ https://www.theicct.org/sites/default/files/publications/ICCT_ethanol_revised_02_03_format.pdf

¹⁰ www.focus.de/auto/ratgeber/e10/ein-jahr-nach-einfuehrung-adac-kein-schaden-durch-e10-bekannt_aid_743169.html

¹¹ <https://www.concawe.eu/publication/report-no-212/>

¹² https://www.epure.org/media/1543/20170407_praesentation_e_end-2.pdf