STUDY NOTES · BASIC CONCEPT

What is E100 fuel? What are flex-fuel vehicles?

Science & Technology

26 Oct 2026

E100 refers to fuel consisting almost entirely of ethanol. Ethanol is an alcohol-based fuel that can be produced from sugarcane, maize and other biomass.

Difference between E20, E85 and E100

Fuel type	Ethanol content	Meaning
E10	10%	10% ethanol blended with petrol
E20	20%	20% ethanol blended with petrol
E85	85%	High-ethanol fuel
E100	Nearly 100%	Almost pure ethanol fuel

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What are flex-fuel vehicles?

Flex-fuel vehicles are specially engineered to operate on different ethanol-petrol blends within their certified fuel range. Flex-fuel vehicles are vehicles specifically designed to run on petrol and ethanol blended fuels in varying proportions. Depending on the vehicle's certification, they may operate on petrol, ethanol-petrol blends such as E20 or E85, or even E100.

Ordinary petrol cars, including those designed for E20, cannot automatically use E85 or E100. The vehicle must be specifically designed and certified for the fuel.

Why is India promoting ethanol fuel?

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1. Energy security: Reduces dependence on imported crude oil.

2. Agricultural support: Creates potential demand for sugarcane and other ethanol feedstocks.
3. Foreign exchange savings: May reduce expenditure on imported petroleum, depending on domestic production and fuel economics.
4. Environmental benefits: Can reduce certain tailpipe pollutants, although overall climate benefits depend on how the ethanol is produced.
5. Industrial development: Encourages investment in biofuel production, vehicle technology and fuel distribution.

What are the challenges?

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1. Ethanol contains less energy per litre than petrol, potentially increasing fuel consumption.
2. High-ethanol fuels require compatible engines and fuel-system materials.
3. E100 availability and distribution infrastructure may initially be limited.
4. Feedstock production can compete with food crops, land and water resources.
5. The overall environmental benefit depends on farming practices, processing energy and land-use changes.

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The Ministry of Road Transport and Highways amended the Central Motor Vehicles Rules, 1989, to include E100 alongside E85 in relevant vehicle emission, fuel-specification and testing provisions. The amendment establishes a regulatory pathway for compatible flex-fuel vehicles; it does not mean that all existing petrol cars can use E100 or that nationwide E100 availability is guaranteed.