



# Renewable Methanol in Denmark. Blender Pumps

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Renewable Methanol – The Motor Fuel Of The Future.

According to EU Renewable Energy Directive (RED) each Member State shall ensure that the share of energy from renewable sources in all forms of transport in 2020 is at least 10 % of the final consumption of energy in transport. 10 % by energy is equivalent to 15-20 % by volume of alcohol.  
 This target calls for amendment of the Fuel Quality Directive (FQD).

## Blend-your-own at the pump



### Blender pumps.

A blender pump is connected to two fuel tanks, one with alcohol and one with gasoline.

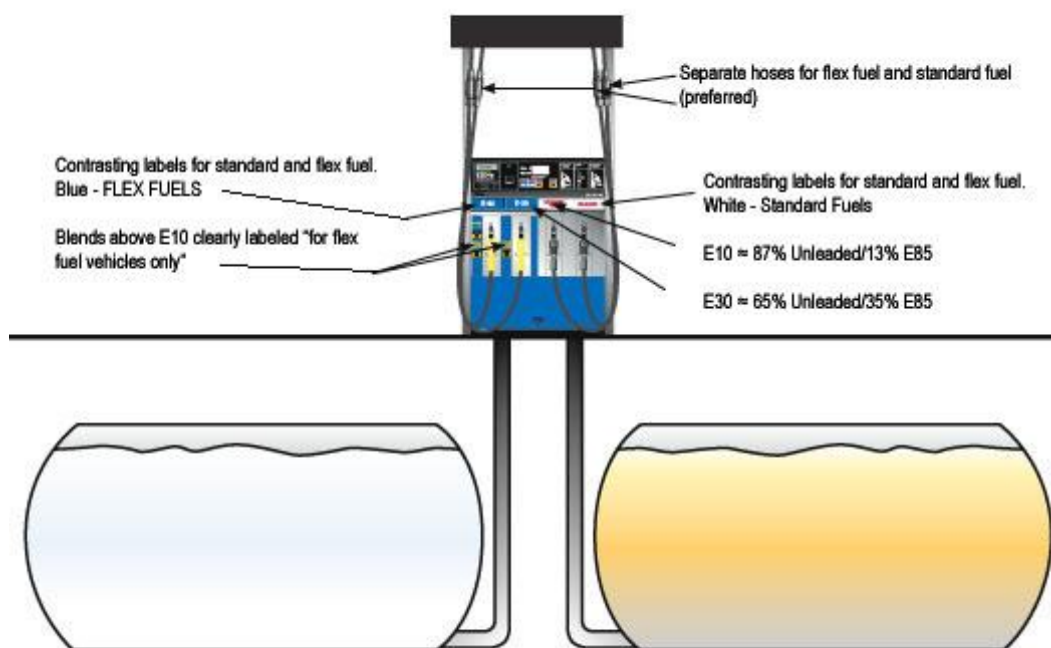
The pump can offer different blends of alcohol ranging from straight gasoline up to an E85 or M85 gas along with different combinations of mid-range alcohol blends.

A blender pump at the Unity Biofuels station in Mount Pleasant offers four choices for ethanol-blended gasoline. The fuels are blended at the pump from ethanol and gasoline stored in separate tanks on site. Ethanol blender pumps, which dispense mid-level ethanol blends, are now eligible for funding under Iowa's Renewable Fuels Infrastructure Program.

The higher alcohol blends from the pump can be used by flex-fuel vehicles. There is a campaign called **Blend Your Own** launched by the American Coalition for Ethanol (ACE) and Renewable Fuels Association (RFA) and leading corn-producing states. That campaign has the goal of 5,000 blender pumps operating nationwide over the next three

years. This past fall, USDA Secretary Tom Vilsack said his goal is to have 10,000 blender pumps installed by 2016. The USDA has been awarding grants to help gas stations install blender pumps.

“Stations with blender pumps have something their neighbor doesn’t”.  
 “As we move forward, there will be more flex-fuel vehicles on the road.”



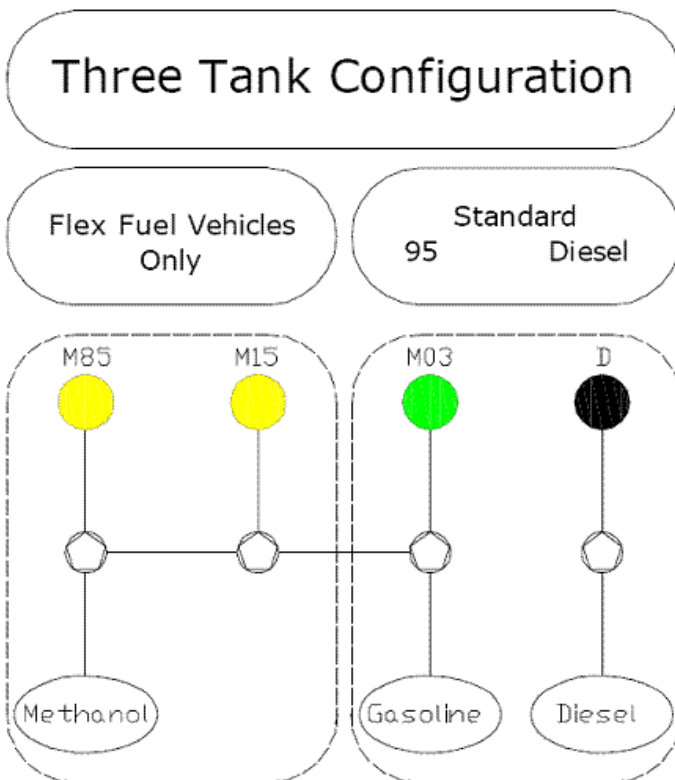
Blender pumps can draw from tanks below ground or free standing. They can mix the contents and dispense through a single hose or separate hoses for each blend. Blender Pumps may be used for any alcohol and gas petrol.

EU Fuel Quality Directive (FQD) defines 'petrol' as *any volatile mineral oil intended for the operation of internal combustion positive-ignition engines for the propulsion of vehicles and falling within certain CN codes headed by 2710 00 00 "Petroleum oils and preparations by weight 70 percent or more of petroleum oils ... "*  
 FQD thus limits the use of methanol for transportation to M1-M3 and M30-M100. Mid-level blends M4-M29 are not allowed?

## Blender pump technology

Blender pumps have been used for dispensing petrol with different octane from one hose. The technology is now getting a boost by the need for flex fuel alcohol blends. The technology is there and may be used for methanol as well and in the future we will see even MD95 diesel replacers based on high methanol blends like ED95.

ED95 designates a blend of 95% ethanol and 5% ignition improver and is used for modified diesel engines with high compression. ED95 was developed in Sweden and has been used with success in around 700 Scania ethanol buses since 1985. As of June 2010 Stockholm has the largest ethanol ED95 bus fleet in the world.



## A modern gas filling station.

No sooner a petrol station gets unprofitable and disappears, a new pops up - remote controlled and unmanned. It generates kiosk sales and is thus an asset to the retailer. The new station can be mobile with tanks skid mounted suitable for flatbed truck transport. The pump may be built-in or an independent unit with tanks placed in a fenced tank yard - easy to move.

Phasing out fossil fuels makes greater demands for new alternative fuels in the future and in this development comes blender pumps to be a central element. For the new and flexible alcohol blends, the blender pump is indispensable.

### Three Tank Configuration with four hoses.

One Diesel tank, a standard pump and one hose is needed in most stations. In the future it will have a blender pump for Methanol-Diesel blends (MD95) plus traditional diesel according to EN590.

Two tanks – one for neat methanol and one for petrol – and a blender pump with three hoses will be a common configuration. More hoses - more blends:

- M3 with 3% methanol according to EN228 will do for all engines.
- M15 will do for most modern cars, but FQD does not allow mid-range blends.
- M30 is just free of FQD restrictions
- M60 will match E85 with same air-fuel ratio (AFR)
- M85 will do for Flex Fuel Vehicles (FFV's) only. M85 should be tax free to compete with standard fossil fuels.
- M100 "Neat methanol" for electric cars with fuel cells on board.



**Transportable Filling Station.**

Courtesy Go'on Gruppen A/S, Denmark



May 2012 the Gas Station of the Future just opened in California with alternative-fuel pumps (Propel Fuels). Backed by more than \$19 million in venture capital and nearly \$12 million in grants from the U.S. Department of Energy and the California Energy Commission, the 23-person Redwood City (Calif.) startup received yesterday an additional, \$10.1 million grant from the commission to help build 100 stations around the state in the next four years. *Source: Karen E. Klein on June 01, 2012.*

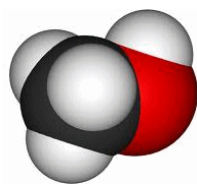
*A new Danish entrepreneurship and start-up company may advantageously take inspiration from the Californian Propel Fuels – the concept is suitable for methanol blends as well.*

### **The European Model – Farmers Gasoline.**

UN has asked the United States and the EU to stop biofuels made from food and feed. Consequently EU has presented proposals for limiting first-generation ethanol in gasoline to a maximum of 5 %.

According to the EU proposal the contribution made by biofuels produced from waste shall be considered to be four times their energy content.

Read the full story: [http://ec.europa.eu/clima/policies/transport/fuel/docs/com\\_2012\\_595\\_en.pdf](http://ec.europa.eu/clima/policies/transport/fuel/docs/com_2012_595_en.pdf)



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