Trinidad Forum

Gil Dankner, CEO & Chairman
DOR GROUP

JANUARY 2019
60 years of excellence
Reduce the share of crude oil in Israel's transportation sector by 30% by 2020 and by 60% by 2025.

ISRAELI GOVERMENTAL DIRECTIVE
METHANOL AS FUEL ALTERNATIVE

METHANOL

M3
M15
M85
M100
GEM
MTBE
BIODIESEL
DME
MARINE
FUEL CELL
European Gasoline Spot Prices vs. European Methanol Spot Prices (Calorie Adj & Non Adj) vs. European Diesel Spot Prices

- **European Gasoline Spot Prices**
- **Methanol Spot** (Cal. Adjusted)
- **Diesel**
- **Gasoline**
- **Methanol** (Cal. Adjusted)
Methanol, Diesel, Gasoline - leakage from a tank creating a pool fire in an area of 100 sq. meters.

LPG – leakage develops to tank explosion (BLEVE).

Comparison of risk ranges (Meters) - Methanol vs Diesel vs Gasoline vs LPG
Joint cooperation with Fiat Chrysler on M15

- Over 3 Million KM accumulated

Fiat 500 Enjoy Natural Energy Methanol
## FCA Emission Test Results

<table>
<thead>
<tr>
<th>Type</th>
<th>95 RON</th>
<th>M15</th>
<th>Improvement %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC mg/km</td>
<td>37</td>
<td>24.5</td>
<td>33.78</td>
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<tr>
<td>CO mg/km</td>
<td>241.5</td>
<td>228.5</td>
<td>5.38</td>
</tr>
<tr>
<td>CO2 g/km</td>
<td>134</td>
<td>132</td>
<td>1.49</td>
</tr>
<tr>
<td>Nox mg/km</td>
<td>19</td>
<td>18.5</td>
<td>2.63</td>
</tr>
<tr>
<td>NMHC mg/km</td>
<td>10</td>
<td>6</td>
<td>40.00</td>
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<tr>
<td>PM mg/km</td>
<td>1.36</td>
<td>1.1</td>
<td>19.12</td>
</tr>
</tbody>
</table>
M15 STANDAR D RELEASED IN ISRAEL

M15
Promoted by Dor

A Newly approved Fuel Standard in Israel

Foreword

This Israeli Standard, SI 90 part 4, is based on the Israeli Standard SI 90 part 2 Automotive gasoline- Unleaded gasoline (which adopts the European Standard EN 228 Automotive fuels- Unleaded petrol - Requirements and test methods, with national modifications and additions).

This Standard is part of a Standard series dealing with automotive gasoline. The Standards in this series are the following:
SI 90 part 2 — Automotive gasoline: Unleaded gasoline
SI 90 part 4 — Automotive gasoline: Methanol-gasoline (petrol) fuel blend composed of 85% unleaded gasoline (petrol) and 15% methanol (M15)
Fiat Chrysler and Eni Cooperating on Emissions Reductions

By THE ASSOCIATED PRESS  NOV. 21, 2017, 1:39 P.M. E.S.T.

MILAN — The CEOs of Italian-American carmaker Fiat Chrysler Automobiles SpA and Italian energy giant ENI have agreed to jointly develop technologies to reduce carbon emissions from vehicles.

The companies signed the agreement Tuesday in Rome with Premier Paolo Gentiloni that broadly focus on technologies related to compressed natural gas and liquefied natural gas — alternative fuels in which Italy has long been a market leader.

The deal also includes the use of a new alternative fuel - **15 percent methanol and 5 percent bioethanol** - that will be tested by five Fiat 500 vehicles in ENI's car sharing service. The companies said **the fuel can reduce carbon emissions by 4 percent**.

FCA CEO Sergio Marchionne said the cooperation aims to achieve "an incisive and permanent reduction in emissions."

The president of the Italian Council Paolo Gentiloni, the CEO of eni, Claudio Descalzi, and the managing director of fca, Sergio Marchionne
Combustibile alternativo ad elevato numero di ottano a base di alcool (A20)
Requisiti e metodi di prova

Alternative Alcohol-Based High Octane Fuel (A20) - Requirements and test methods

Lo scopo del documento è di definire le proprietà chimiche e gli standard di un combustibile alternativo a basso contenuto di carbonio e alto numero di ottano per nuovi motori dedicati ad accensione comandata e per tutte gli autoveicoli compatibili con E10.

A20 = M15 + E5
EMISSION REDUCTION TARGETS

Average CO2 emission g/km

Number of Vehicles in KK

2015 TARGET LINE

2020 TARGET LINE
GEM :

Gasoline, Ethanol & Methanol mixtures

• FFV Vehicles can use up to 85% Ethanol / Methanol
• FFVs are marketed worldwide
• M70 blends tested in Flexible Fuel Vehicle (FFV)
• There are at least 25 Million FFV in the US
M51-M85 AMERICAN STANDARDS

Designation: D 5797 – 07

Standard Specification for Fuel Methanol (M70-M85) for Automotive Spark-Ignition Engines

Designation: D5797 – 16

Standard Specification for Methanol Fuel Blends (M51–M85) for Methanol-Capable Automotive Spark-Ignition Engines

2007

UPDATED 2016
## AVAILABLE STANDARDS

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>STANDARD</th>
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<tbody>
<tr>
<td>ISRAEL</td>
<td>M15</td>
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<tr>
<td>INDIA</td>
<td>M15, M100</td>
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<td>ITALY</td>
<td>A20</td>
</tr>
<tr>
<td>USA</td>
<td>M51-M85</td>
</tr>
</tbody>
</table>
STEAM BOILERS CONVERTED TO METHANOL
DOR and Israel Electric Company (IEC) developed Methanol application for Power plants

Converted a Pratt & Whitney 50 MW Gas Turbine Unit in Eilat, Israel from Diesel to 100% Methanol firing
GAS TURBINES CONVERTED TO METHANOL
FILTER COMPARISON

DIESEL

METHANOL
M100

100% Methanol Engine
The Future for Diesel Trucks*

100% methanol solution to replace diesel fueled trucks

* Under development
DOR Group will transfer know-how on Methanol Blending to the **Government of India**

**December 7-8 2017** - Meeting with:
Mr. Nitin Gadkari  
Minister of Roads and Transportation  
Dr. VK Saraswat  
NITI Aayog member and Chairman of the Combustion Institute
Mumbai: Union Roads Minister Nitin Gadkari today said the government will be soon announcing a policy which calls for 15 per cent blending of methanol in petrol to make it cheaper and also reduce pollution.

"In the upcoming Parliament session, I am announcing a policy of blending 15 per cent methanol in petrol," Gadkari said at an event organised by Moneycontrol and Free Press Journal here.

He said methanol gets made from coal and costs only Rs 22 per litre as against the prevailing price of about Rs 90 per litre for petrol and added that China is making the coal byproduct for Rs 17 per litre itself.

"The costs will go down, pollution will go down," the Union minister said.

He said factories in and around Mumbai, including Deepak Fertilisers and Rashtriya Chemicals and Fertilisers (RCF), can generate methanol.

Gadkari said Swedish auto major Volvo has got a special engine to the financial capital which runs on methanol and using the locally available methanol, he will be attempting to run 25 buses entirely on the fuel.

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Niti Aayog evaluating ₹5,000 crore Methanol Economy Fund
Updated: December 19, 2017
19:56 IST | Our Bureau

Dr. VK Saraswat, NITI Aayog member and Chairman of the Combustion Institute
(Indian Section)

- 1 crore = ₹10 Million Rupees
- 5000 Crore = $780 Million USD
THANK YOU

January 2019