ME-LGI Engines
Liquid gas injection – methanol and LPG
The ME-LGI Concept
Liquid Gas Injection Engine

The ME-LGI concept

The ME-LGI concept has been implemented on the new ME-LGIM engine, where M stands for methanol. Today, the ME-LGIM engine has been ordered for a series of seven 50,000 dwt methanol carriers and, as of July 2016, seven engines have been delivered. The first of these ships are already in service, operating on methanol as fuel.

Originally designed for low-flashpoint liquid fuels, the ME-LGI concept is now also being developed for LPG operation under the engine designation ME-LGIP, where P stands for propane. The ME-LGI concept can be applied on all MAN B&W two-stroke low-speed engine types, either ordered as an original unit or as a retrofit solution. With the ME-LGI concepts, MAN Diesel & Turbo has expanded its dual-fuel portfolio even further, enabling the exploitation of other low-flashpoint fuels such as ethanol, dimethyl ether (DME) and gasoline.

The new engine benefits arise from well-proven electronic controls and from the safety concept developed for the dual-fuel ME-GI engine for natural gas operation, which has become the standard solution in LNG carriers today. The ME-LGI engine concept also comprises the so-called booster fuel injection valve. This innovative fuel booster, specially developed for low-flashpoint liquid fuels, ensures that a low-pressure fuel gas supply system can be employed, significantly reducing first-time costs and boosting reliability.

The fluctuating fuel prices and new shipping regulations have led MAN Diesel & Turbo to develop the ME-LGI design in order to be able to offer shipowners the possibility of using an additional low-sulphur fuel at a relatively small cost and with enhanced environmental benefits. In this respect, the ability of the ME-LGI engine to run on sulphur-free fuels offers great potential for ship operation within SECA zones.

Expected emission reductions*

<table>
<thead>
<tr>
<th></th>
<th>NOx</th>
<th>SOx</th>
<th>PM</th>
<th>CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG</td>
<td>20-30%</td>
<td>90-97%</td>
<td>90%</td>
<td>23%</td>
</tr>
<tr>
<td>LPG</td>
<td>15-20%</td>
<td>90-97%</td>
<td>90%</td>
<td>20%</td>
</tr>
<tr>
<td>MeOh</td>
<td>30-50%</td>
<td>90-97%</td>
<td>90%</td>
<td>10%</td>
</tr>
</tbody>
</table>

*Compared to the Tier IV engine operating on HFO, conventional fuel valve and HFO pilot oil.

ME-LGI development

MAN Diesel & Turbo introduced its dual-fuel, gas-injection ME-GI engine in 2012. Orders were received immediately, confirming the growing market demand for the option to operate ships on LNG as well as HFO in the face of increasing fuel prices. As a result of the market interest, the company has now extended its dual-fuel engine programme with an ME-LGI unit that can run on alternative low-flashpoint liquid fuels.

Methanol and LPG carriers have already operated at sea for many years, and many more LPG tankers are currently being built as the global LPG infrastructure grows. With a viable, convenient and comparatively cheap fuel already on board, it makes sense to save time for bunkering by using a fraction of the cargo to power the vessel. In addition, with the important environmental benefit in terms of emissions, MAN Diesel & Turbo states that it is already offering a Tier III compatible ME-LGI version. Both EGR and SCR solutions are available.

MAN Diesel & Turbo already reports significant interest in the ME-LGIP engine and expects orders from owners of LPG carriers within the near future.

MAN Diesel & Turbo’s experience with two-stroke, dual-fuel engines operating on NG and LPG stretches back to the 1990s. As such, we have long been prepared for this market development and feel uniquely poised to deliver the optimal solutions.

The company states that it expects all of its existing MAN B&W two-stroke engines to be retrofittable – in a cost-efficient manner – for operation according to the LGI concept.