g-Methanol™

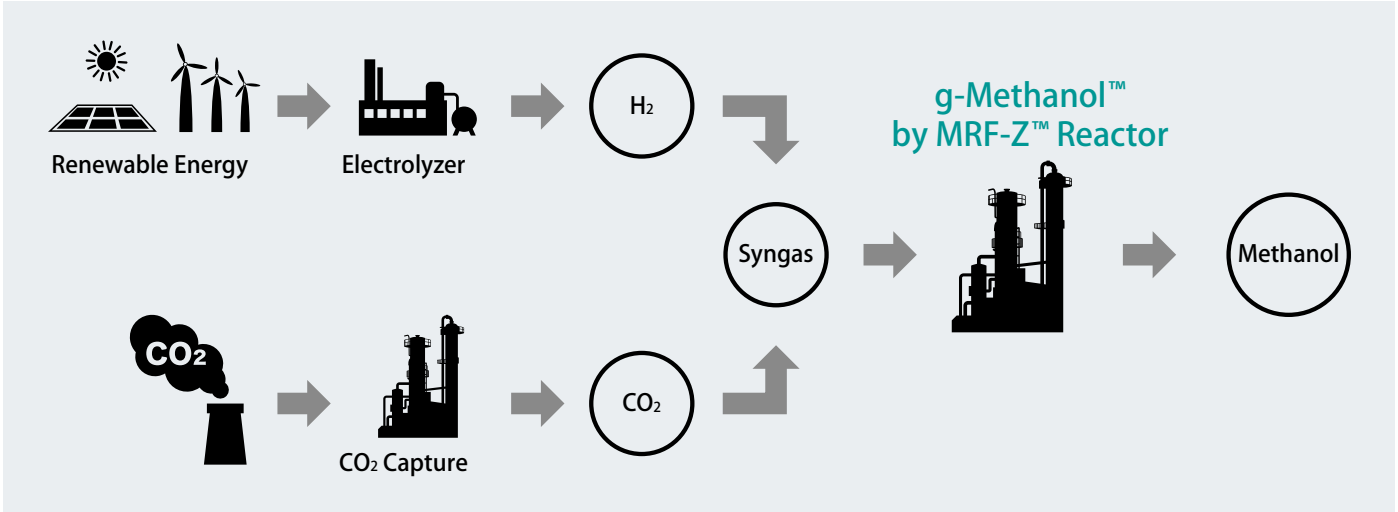
Low-Carbon Footprint Methanol

REALIZE AN ENVIROMENTALLY-FRIENDLY SOCIETY

Toward environmentally-friendly society, one of TOYO's solution is to realize the technology of recycling-oriented society.
Our responsibility is to provide solution for "Sustainable supply of clean energy" & "Building value chain" based on own technology and experience in the chemical and energy industries.

CONCEPT OF g-Methanol™

g-Methanol™ is kind of renewable Methanol by synthesizing CO_2, which is captured from various exhaust sources and utilized as feedstock of Methanol, and H_2, which is generated by water electrolysis using renewable electricity.



WHY CONSIDER g-Methanol™?

- Contributing to Net CO_2 Zero Emission by 2050.
- Creating values from CO_2.
- Converting CO_2 to olefins via g-Methanol™ not fossil resource.
- Reducing greenhouse gas emissions by using g-Methanol™ as transportation fuels.
- Energy transition from renewable energy to drop-in fuel.

TOYO TECHNOLOGY SOLUTIONS OFFERS

TOYO offers appropriate solution to meet the process features of the direct CO_2 to Methanol synthesis process by its proprietary MRF-Z™ Reactor.

Proprietary Methanol Synthesis Reactor; MRF-Z™ Reactor

Minimize the catalyst volume by Multi-Stage Indirect Cooling. Suitable heat removal is key technology to produce methanol from CO_2 with minimum catalyst volume. Thanks to Multi-Stage Indirect Cooling, the temperature profile in the catalyst bed is optimized by a suitable cooling tube arrangement. Optimized temperature profile along the maximum reaction rate line provides optimum amount of catalyst.

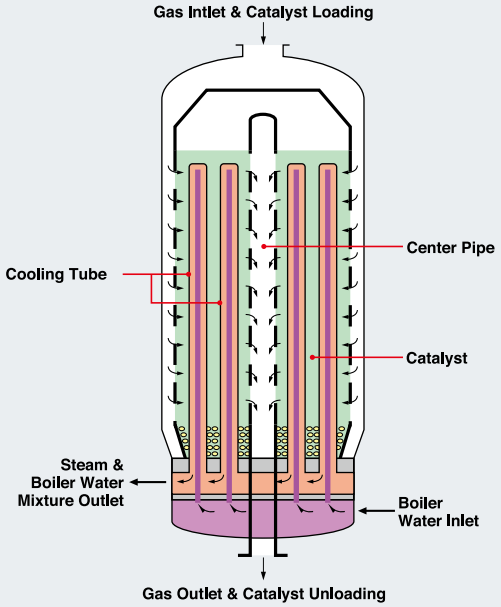
Easy Catalyst loading and unloading

Features of MRF-Z™ reactor, shell-side catalyst loading and bayonet boiler tubes and TOYO's proprietary mechanical design, result in realization of easy maintenance.

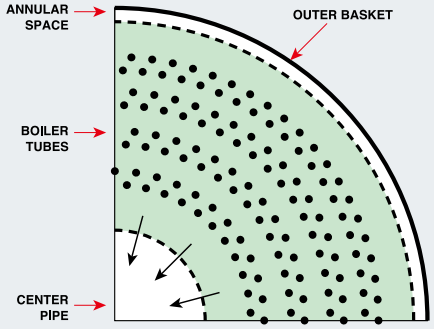
Other features

- Shell-side catalyst /Wide Range Single Train Capacity
- Steam Raising Methanol Reactor / Best Use of Surplus Heat
- Cross Flow to Cooling Tubes / Maximum Heat Transfer
- Radial Gas Flow / Low Pressure Drop
- Bayonet Boiler Tubes / No Thermal Stress
- Single Responsibility from Process Licensing to EPC including water electrolysis.
- Propose supply chain

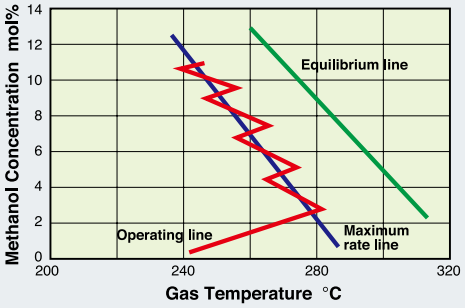
MRF-Z™ Reactor



MRF-Z™ Tube Arrangement



Temp Profile of MRF-Z™ Reactor



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