



Operational Excellence Services

Decarbonization CO2 Removal Solutions



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Access to Our Homepage

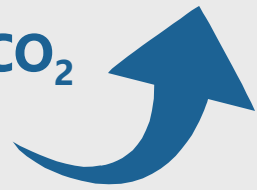
 <https://www.jgc.com/en/business/epc/operation-maintenance/service/>

CO₂ Removal Solutions

Challenges for CO₂ Capture in Operating Assets

Management of Increased CO₂ in Feed Gas

CO₂



- ✓ Natural gas and associated gas quality varies over the life of oil and gas fields.
- ✓ Unexpected increases of CO₂ in the feed gas requires additional CO₂ capture units or enhancement of the CO₂ capture performance.

Limited Space and Utilities



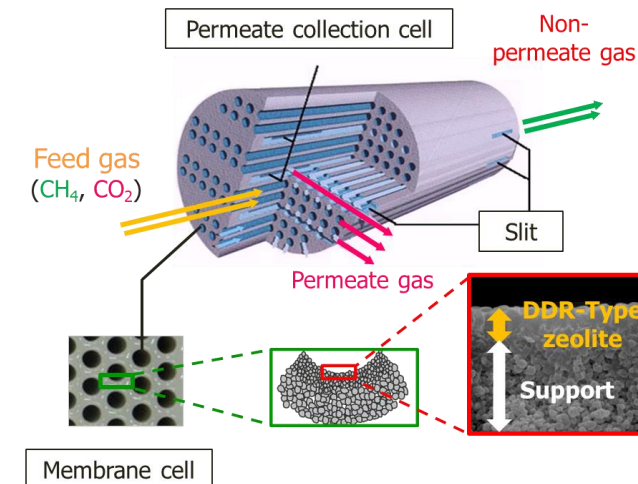
- ✓ Limitation in the available space to accommodate the new unit or expansion of the unit.
- ✓ Limitation in the available utilities to operate the CO₂ removal unit

HiPACT® - an Innovative CO₂ Capture Process



Commercial HiPACT™ plant (NIS, Serbia)*1

DDR Membrane - High Performance Separation Technology



CO₂ Removal Solutions – DDR Zeolite Membrane

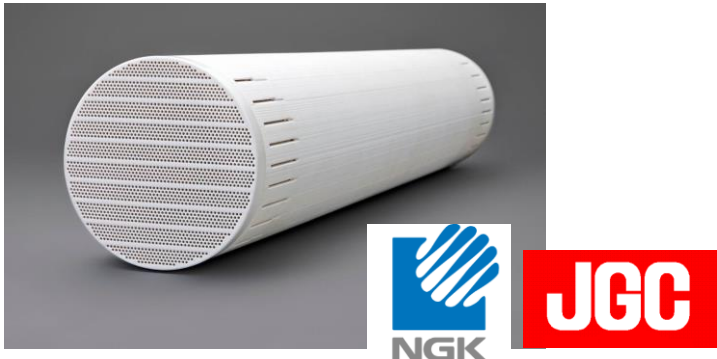
DDR Zeolite Membrane

■ Technology

- Technology jointly developed by JGC and NGK
- World's largest zeolite membrane element

■ Advantages

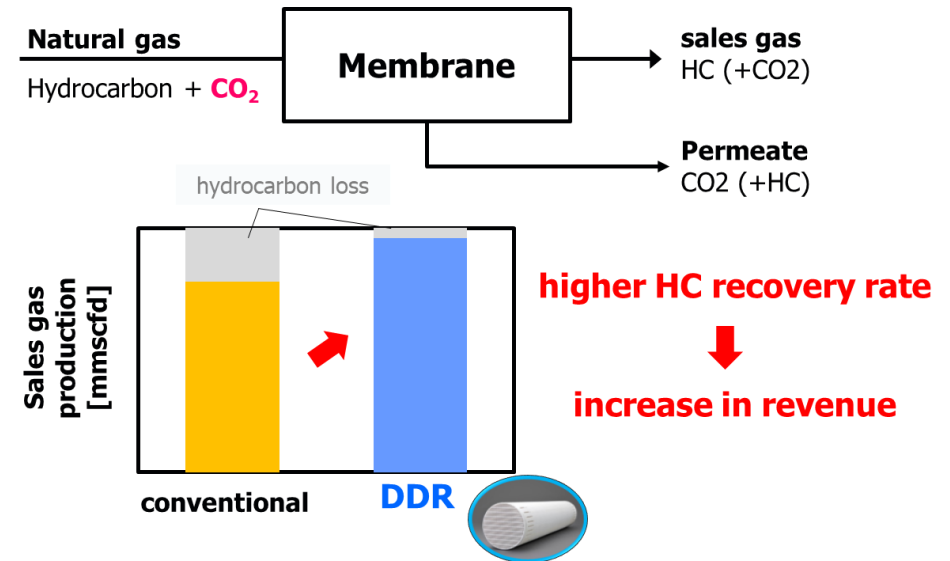
- Enhanced separation performance
= minimal hydrocarbon loss
- Tough under high pressure, high CO₂ concentration
= longer membrane life
- Significant lifecycle cost saving (20-30%)



■ Application

- Natural Gas Processing (CO₂ removal in CO₂ rich gas fields)
- CO₂ recovery from associated gas for CO₂-EOR^(*) projects

(*) EOR: Enhanced Oil Recovery



■ Technology Development Status

- Field tested at U.S. oil field (2017, completed)
- Commercial scale field test at U.S. oil field (from 2020)

Details of the technology can be found at:

<https://www.jgc.com/en/business/tech-innovation/environment/ddr-membrane.html>

CO₂ Removal Solutions - HiPACT®

HiPACT® - CO₂ Capture Process

■ Technology

- Chemical absorption process, using newly developed absorption solvent (jointly developed with BASF)

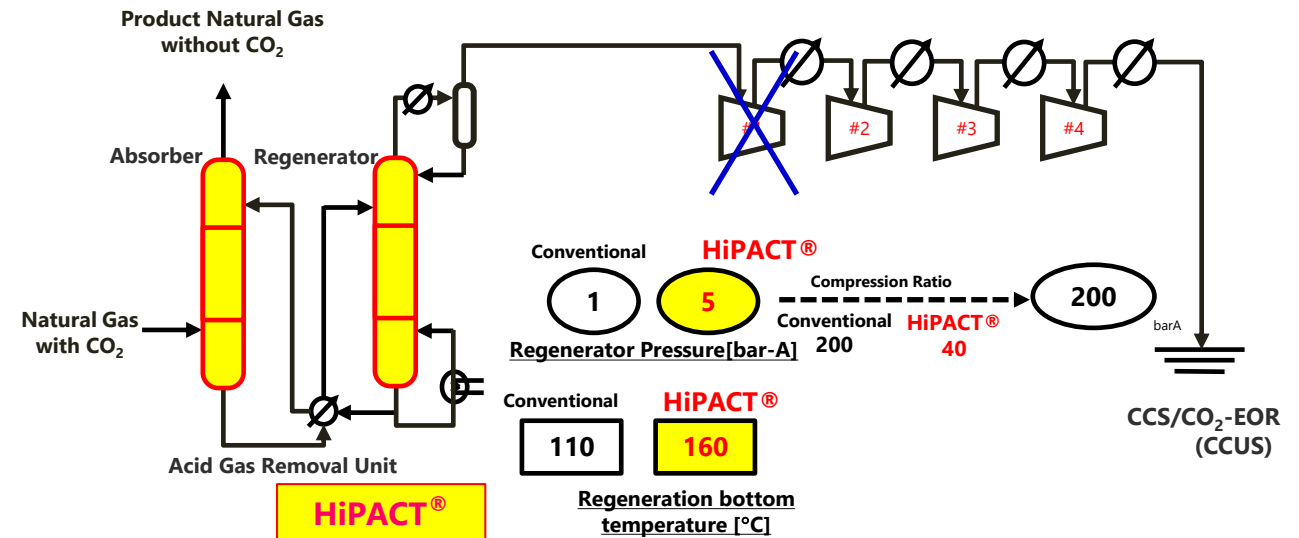
■ Advantages

- Highly stable against thermal degradation
- Enables high pressure CO₂ stripping, leading to significant energy and cost saving (25 to 35% reduction)
- Reducing the number of compression stages, optimizing the space



■ Reduction of initial investment and reduction of operating costs

by high pressure CO₂ stripping process

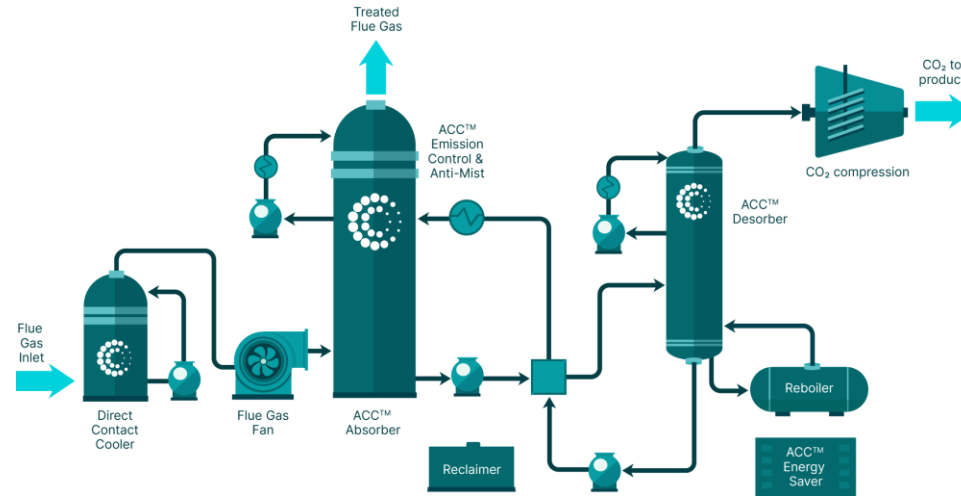


Details of the technology can be found at:

<https://www.jgc.com/en/business/tech-innovation/environment/hipact.html>

CO₂ Removal Solutions – flue gas (e.g. gas turbine)

JGC and SLB Capturi initiated strategic collaboration dialogue.



- ❑ Applied to hard to flue gas in abate industry: Cement, Biomass Power, Waste Energy
- ❑ The solution contributes to GHG reduction in FPSO (e.g. CO₂ capture from gas turbine flue gas)
- ❑ There is a dedicated design concept suited to offshore application.