

SPECIALTY SYSTEMS · CARBON RECYCLING

Green Methanol Production Plant

Advanced catalytic synthesis that recycles captured CO₂ and renewable H₂ into 99.99% high-grade fuel methanol.

99.99%

METHANOL PURITY

85–95%

CO₂ CONVERSION WITH
RECYCLE

50–100

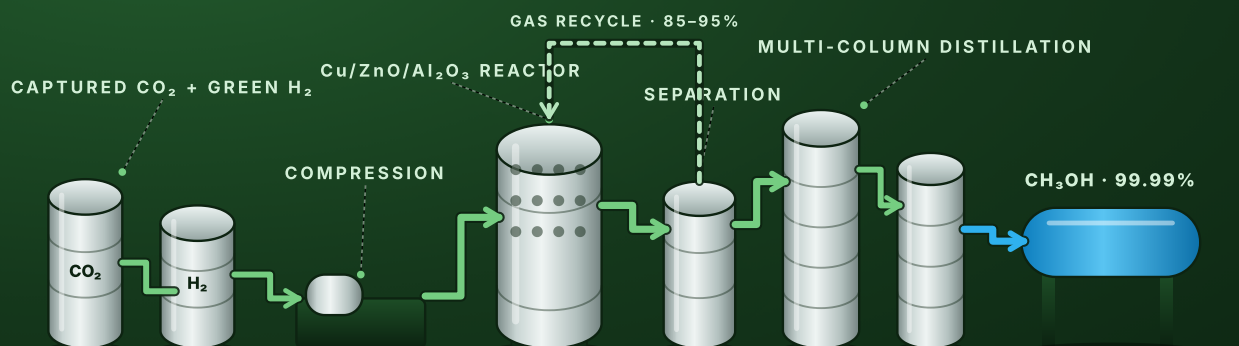
BAR OPERATING PRESSURE

3:1

H₂ : CO₂ FEED RATIO

PROCESS OVERVIEW

GREEN METHANOL PRODUCTION PLANT



01 Overview

Green methanol closes the carbon loop: captured industrial CO₂ and renewable hydrogen become a liquid fuel and chemical feedstock that slots directly into existing engines, tankers and chemistry. The Brise Green Methanol Production Plant performs this conversion through advanced catalytic hydrogenation over a fixed-bed Cu/ZnO/Al₂O₃ catalyst at 50–100 bar and 200–280 °C.

Per pass, 15–25% of the CO₂ converts; with gas recycle the plant achieves 85–95% overall conversion, and multi-column distillation lifts the product to 99.99% purity — customisable higher for specialty grades. The result is a fuel-grade methanol stream made from emissions rather than fossil carbon.

02 At a Glance



Carbon-negative logic

Feeds on captured CO₂ that would otherwise be vented



Drop-in product

Fuel-grade methanol for engines, blending and chemistry



High overall conversion

85–95% CO₂ conversion with gas recycle

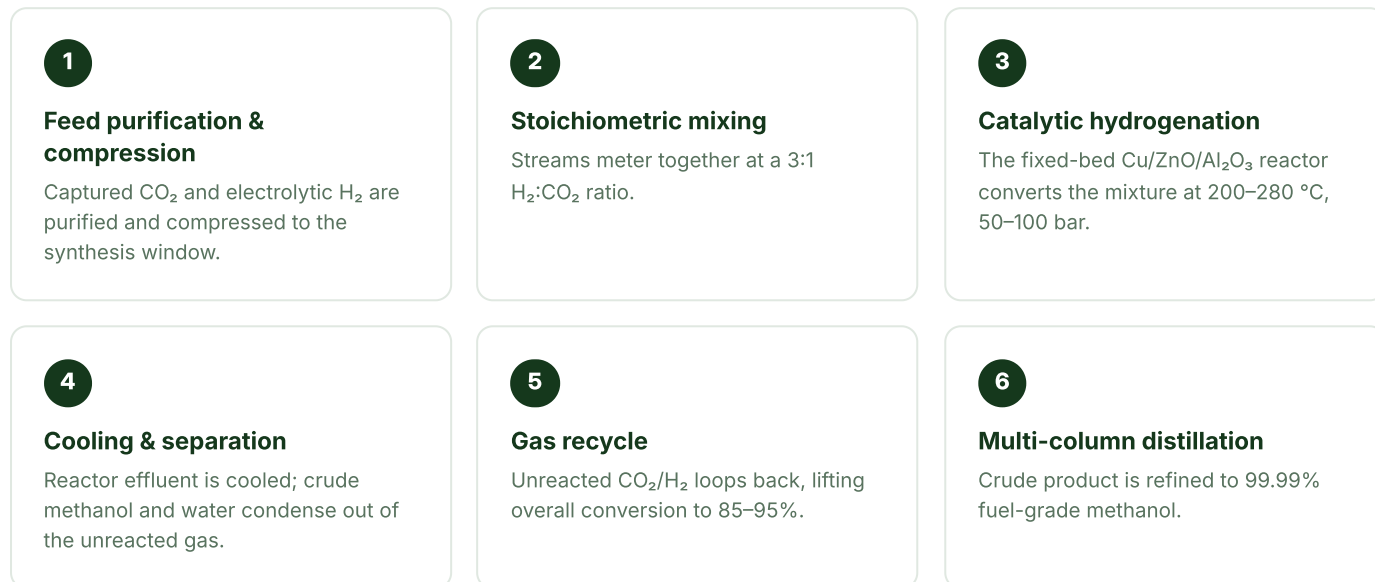


Proven catalysis

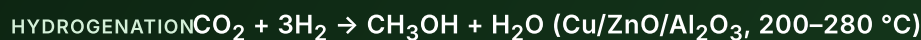
Industrial Cu/ZnO/Al₂O₃ fixed-bed chemistry

03 Technology & Process

Purified, compressed CO₂ and H₂ are mixed at 3:1 stoichiometry and hydrogenated over a copper–zinc oxide catalyst; cooling separates crude methanol from unreacted gas, which recycles to the reactor while distillation polishes the product:



SYNTHESIS REACTION



End-to-end EPC delivery

Concept, FEED and engineering through construction, commissioning and PG testing.



Certified quality

ISO 9001 / 14001 / 45001 systems; designs per PESO, IEC, ATEX & IS standards.



Lifecycle partnership

Operator training plus AMC/CMC programmes for maximum plant uptime.

04 **Technical Specifications**

PARAMETER	SPECIFICATION
Feedstock	CO ₂ (captured) + H ₂ (from electrolysis)
Main reaction	CO ₂ + 3H ₂ → CH ₃ OH + H ₂ O
Operating pressure	50–100 bar
Operating temperature	200–280 °C
Catalyst	Cu/ZnO/Al ₂ O ₃ , fixed bed
Methanol purity	99.99% (customisable higher)
CO ₂ conversion per pass	15–25%
Overall conversion (with recycle)	85–95%
H ₂ : CO ₂ feed ratio	3 : 1
Purification	Multi-column distillation

✔ Plant capacity and utility integration are engineered per project during FEED / basic engineering. Figures shown are design values from Brise Chemicals product documentation; final specifications are confirmed during detailed engineering.

05 **Key Features**



True carbon recycling

Converts captured emissions into saleable fuel and feedstock.



99.99% product purity

Multi-column distillation delivers fuel-grade and specialty grades.



Efficient recycle loop

85–95% overall CO₂ conversion from a 15–25% per-pass baseline.



Proven catalysis

Industrial Cu/ZnO/Al₂O₃ fixed-bed system — no exotic chemistry risk.



Renewable integration

Designed around electrolytic hydrogen and captured CO₂ feeds.



Scalable modules

Capacity engineered to feedstock availability and offtake.

06 Applications & Industries



Marine & transport fuel

Green methanol bunkering and fuel blending



Chemical feedstock

Formaldehyde, olefins and downstream chemistry



Hydrogen carrier

Liquid, dense, room-temperature H₂ logistics



Carbon recycling / CCU

Monetising captured industrial CO₂

07 Scope of Supply



CO₂ & H₂ purification and compression trains



Fixed-bed synthesis reactor & catalyst charge



Cooling, separation & gas-recycle loop



Multi-column distillation section



PLC/DCS controls & safety systems



Commissioning, training & AMC/CMC

**CERTIFIED &
COMPLIANT**

ISO 9001:2015

ISO 14001:2015

ISO 45001:2018

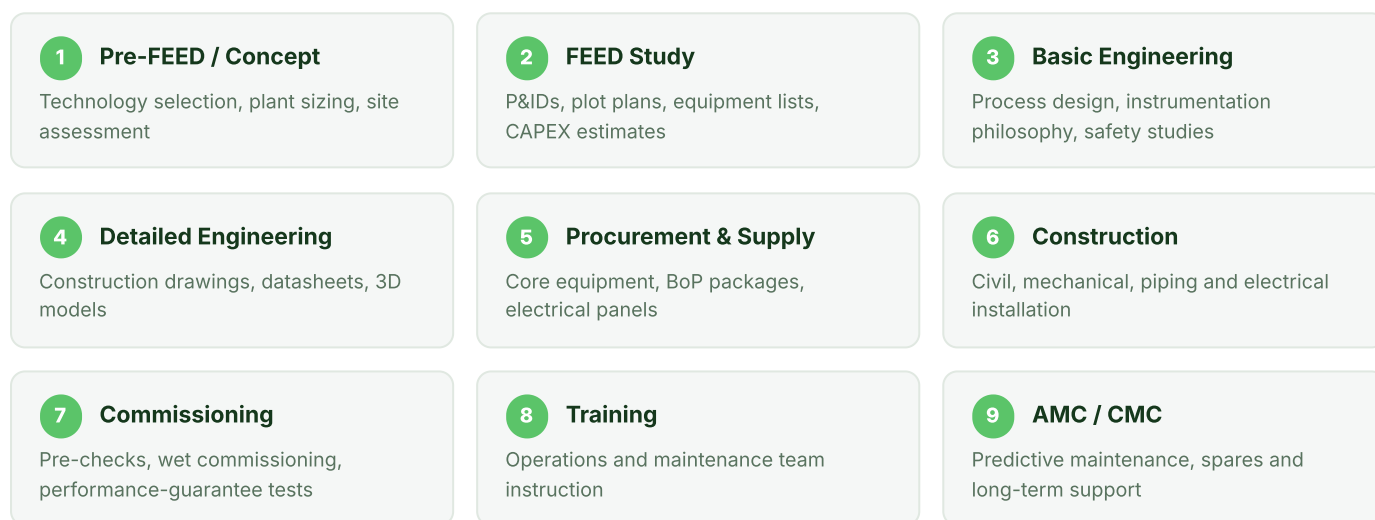
Designs compliant with PESO, IEC, ATEX &
IS safety standards

08 About Brise Chemicals

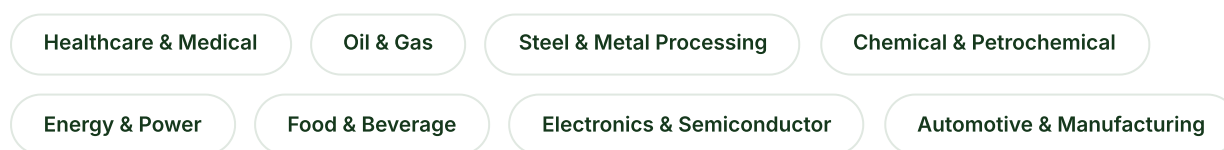
Brise Chemicals Pvt. Ltd. is a technology-driven OEM and industrial gas plant technology owner, founded by professionals with deep experience across turbo-machinery, oil & gas, refineries and the industrial gas sector. From our engineering and fabrication base in Pune, India, we design, engineer, manufacture, install and commission cryogenic and non-cryogenic gas plants — spanning alkaline electrolysis, gas generation, gas purification, ammonia and methanol synthesis, air separation and hydrogen liquefaction.

Our name derives from the ballet step “Brisé” — a reminder that precision, integrity and discipline underpin everything we build. With in-house fabrication, certified welding, an HVOF catalyst-coating facility and rigorous QA/QC, we deliver complete EPC projects and stand behind them through long-term AMC/CMC support.

09 The Brise EPC Lifecycle



10 Industries We Serve



Let's engineer your plant.

Request a detailed proposal, FEED study or site consultation for the Green Methanol Production Plant.


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