

GAS PURIFICATION · ULTRA-HIGH PURITY

UHP Gas Purification Plant (N₂ · O₂ · H₂ · Ar)

From 4N–5N feed gas to 7N–8N ultra-high purity — getter-bed and palladium-membrane purification for nitrogen, oxygen, hydrogen and argon.

8N

OUTLET PURITY, UP TO
99.999999%

<1 ppb

TYPICAL RESIDUAL
IMPURITIES

–70 °C

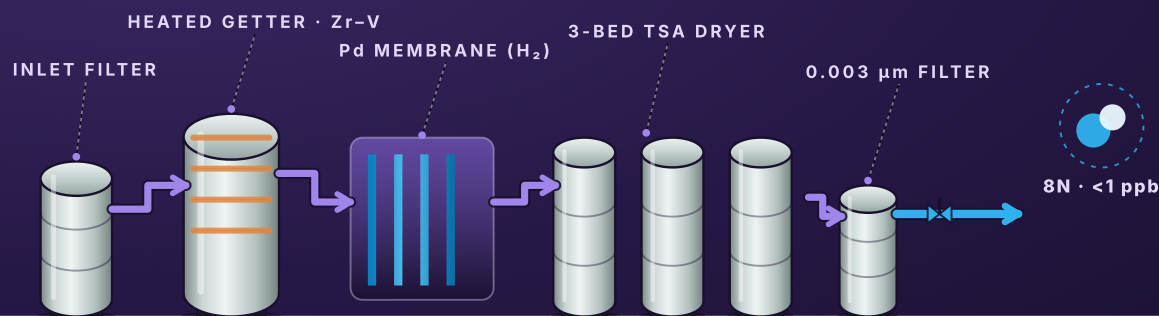
PRODUCT DEW POINT

<0.5 bar

PRESSURE DROP ACROSS
PLANT

PROCESS OVERVIEW

UHP GAS PURIFICATION PLANT



01 Overview

Semiconductor fabs, analytical laboratories and photonics lines live or die by gas quality measured in parts per billion. The Brise UHP Gas Purification Plant upgrades standard 4N–5N nitrogen, oxygen, hydrogen or argon to ultra-high purity 7N–8N product — removing H₂O, O₂, CO, CO₂, CH₄ and non-methane hydrocarbons to below 1 ppb typical residuals.

Purification chemistry is matched to the gas: heated getter beds of reactive Zirconium–Vanadium alloys for N₂, O₂ and Ar, and heated palladium-alloy membranes for hydrogen — through which only H₂ can dissociate and diffuse, physically blocking every impurity. Electropolished 316L stainless construction prevents outgassing from the wetted surfaces themselves.

02 At a Glance



Four gases, one platform

Dedicated purifier trains for N₂, O₂, H₂ and Ar



ppb-level performance

<1 ppb typical residual impurities at outlet



Ultra-dry product

Three-bed TSA dryer systems reach –70 °C dew points

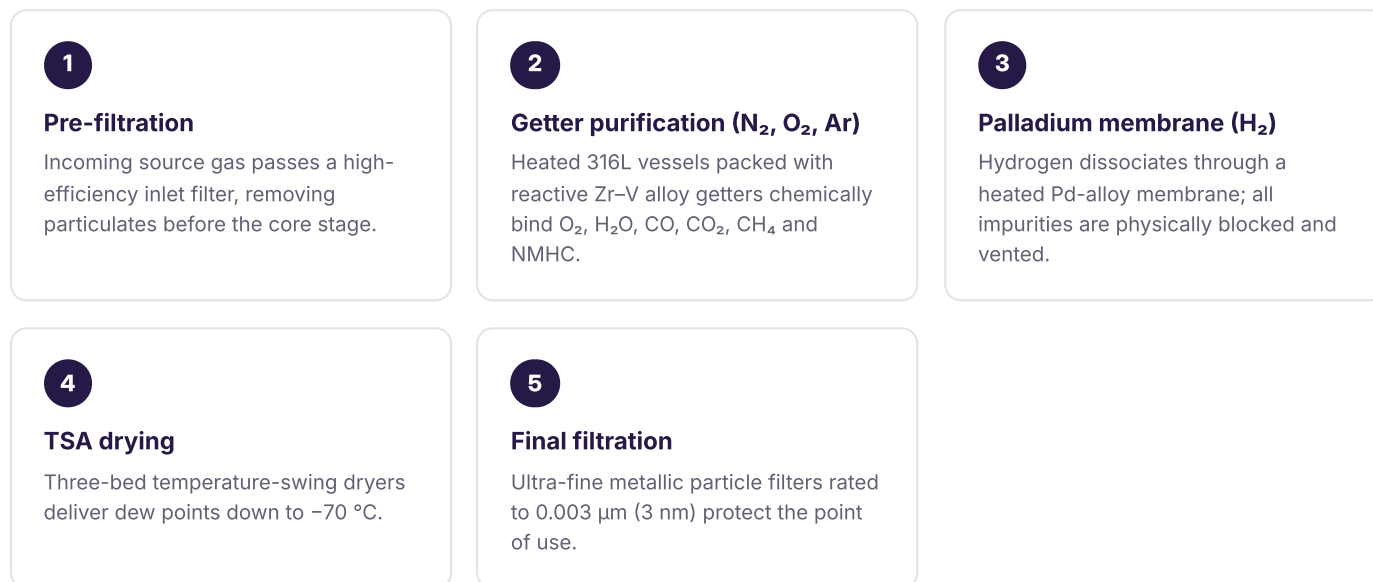


Fab-grade construction

Electropolished 316L SS wetted parts throughout

03 Technology & Process

Each purifier train combines three stages — pre-filtration, core purification matched to the gas species, and final sub-micron filtration — plus deoxidation and three-bed TSA drying for ultra-dry delivery:



Purity classes, decoded

Each 'N' is one more nine — and one order of magnitude fewer impurities:

4N — 99.99%	≈ 100 ppm total impurities · standard industrial grade (typical inlet)
5N — 99.999%	≈ 10 ppm total impurities · high-purity grade (typical inlet)
7N — 99.99999%	≈ 100 ppb total impurities · UHP outlet class
8N — 99.999999%	≈ 10 ppb total impurities · UHP outlet, <1 ppb residuals typical



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
Target gases	N ₂ , O ₂ , H ₂ , Ar
Inlet purity	≥ 99.99% (4N) to 99.999% (5N)
Outlet purity	≥ 99.99999% (7N) to 99.999999% (8N)
Core technology	Catalytic bed · heated getter · Pd membrane (H ₂)
Impurities removed	H ₂ O, O ₂ , CO, CO ₂ , CH ₄ , NMHC
Residual impurities	< 1 ppb typical
Product dew point	Down to -70 °C (three-bed TSA dryer)
Operating pressure	5–15 bar
Operating temperature	Ambient to 400 °C (core stage)
Pressure drop (ΔP)	< 0.5 bar
Materials	Electropolished 316L stainless steel (anti-outgassing)
Final filtration	0.003 μm (3 nm) metallic particle filter

✓ Purifier sizing, redundancy and analytics are configured to the fab or laboratory specification per project. Figures shown are design values from Brise Chemicals product documentation; final specifications are confirmed during detailed engineering.

05 Key Features

 4 orders of magnitude Lifts standard 4N–5N gas to 7N–8N — impurities measured in ppb, not ppm.	 Chemistry matched to gas Zr–V getters for inerts and O ₂ ; palladium membrane exclusively for H ₂ .	 Ultra-dry delivery Three-bed TSA systems hold product dew points to -70 °C.
 No re-contamination Electropolished 316L and 3 nm final filtration protect purity to the tool.	 Low process penalty Under 0.5 bar pressure drop across the complete purification train.	 Continuous duty Staged beds and dryers regenerate in sequence for uninterrupted supply.

06 Applications & Industries



Semiconductor fabs

Carrier, purge and reactive gases for wafer fab, litho and CVD



Analytical chemistry

Zero, carrier and calibration gases for GC, MS and ICP



Fiber optic production

Preform manufacturing and optical fiber drawing



Advanced materials

Inert environments for nanomaterials and ALD



Pharma & biotech

Controlled inert blanketing and API packaging



Display & LED

Thin-film deposition and etching processes



Aerospace & defence

Critical sensors and propulsion system testing

07 Scope of Supply



Gas-specific purifier trains (getter / Pd membrane)



Deoxidation & three-bed TSA dryer systems



Electropolished 316L process piping & vessels



Sub-micron final filtration (0.003 µm)



Purity analytics, PLC controls & alarms



Installation, commissioning, training & AMC/CMC

**CERTIFIED &
COMPLIANT**

ISO 9001:2015

ISO 14001:2015

ISO 45001:2018

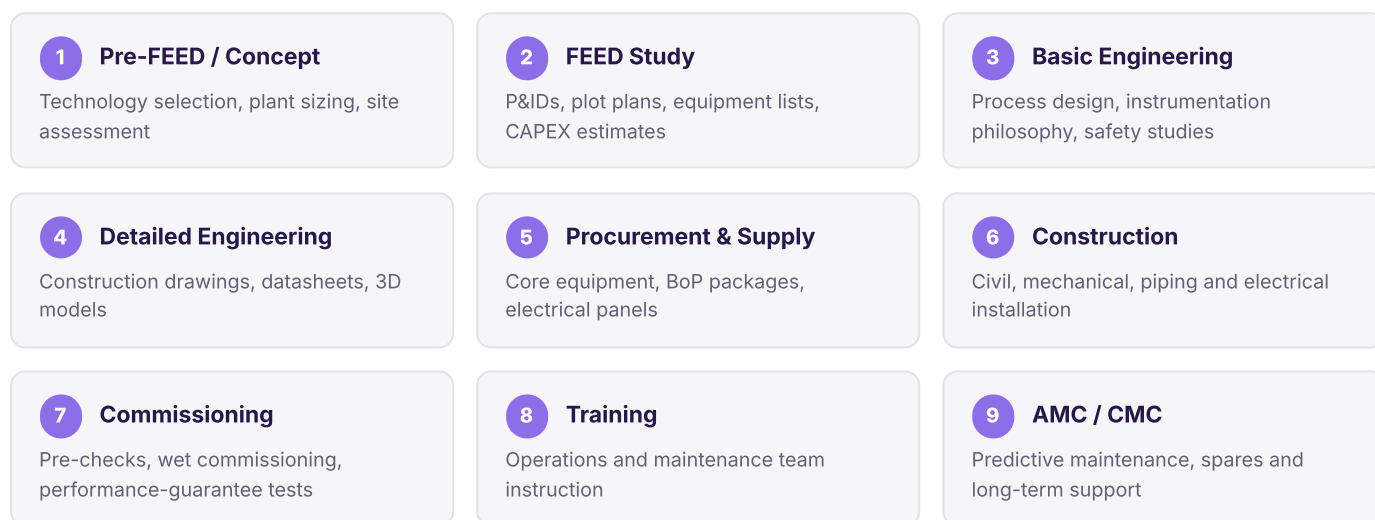
Designs compliant with PESO, IEC, ATEX & IS safety standards

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 UHP Gas Purification Plant.


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