GuardAlytix™

User guide · R8

Free and registration-free: enter conditions → calculate → review the protection train and engineering assessment → download the basic PDF. Support and quotation requests remain optional.

01 Language and technical examples

Open www.maestroguard-filter.com/calculator/index.html. Choose English, German, Italian or French under “Language”. Under “Technical Example” load presets such as Natural Gas – Wet / Rich, Raw Biogas – Wet, Sour Gas, Hydrogen Blend or Electrolyzer, then click “Load Example”. All example data can be modified; presets are not project-specific design recommendations.

02 Application and analyzer

Select “Application” and “Analyzer type” (e.g. GC, moisture, dew point, H_2S, NH_3, O_2 or H_2). “Preconditioning system available / planned?” uses YES/NO, with an installation-location option for YES. Select YES only if a stage is installed or actually planned; it does not confirm its particle/coalescing function. For an electrolyzer enter the H_2/O_2 side and potential KOH or electrolyte exposure.

03 Composition and water

Choose DRY (H_2O entered separately) or WET (H_2O included in composition). Enter mol-% totaling 99.5–100.5%; blank is unreported, while 0 is an explicit zero. For natural gas expand C_2+, heavy-end and optional aromatic compounds; never count a lumped fraction and its constituents twice. Enter water as ppmv, mg/Nm³ or a known dew/frost point with its reference pressure. “Not known” is permitted; with WET composition the H_2O fraction is the basis, and conflicting water inputs are rejected.

04 Pressure, temperature and flows

The third panel describes the final MaestroGuard: pressure, minimum/normal/maximum sample temperatures, analyzer flow and separate bypass/sweep flow. Process pressure and temperature describe upstream preconditioning. Select bar(a) versus bar(g) and NL/min versus actual L/min carefully; changing pressure unit reinterprets the entered numbers rather than automatically converting them. Normal reference: 0 °C / 1.01325 bar(a). When Z is absent, Z = 1 is disclosed as an assumption. The default dew-point temperature margin is 5 K and may be adjusted under Advanced settings.

Important: Analyzer flow and sweep/bypass flow are separate values. A missing flow is not zero; enter zero bypass only where none actually exists. A liquid-removal/sweep path must work continuously when specified.

Contamination and protection train

05 Report contamination accurately

In the fourth panel classify particles, mist/aerosol, entrained liquid, bulk liquid, two-phase flow and liquid slugs as YES / NO / UNKNOWN. For YES enter the loading, liquid type and quantitative ml/h input where required. “Mixed water and HC liquid” requires separate water and HC entries. Predicted vapor condensate is assessed separately from entrained process liquid; do not sum stage quantities from different pressures and temperatures.

Advanced wet and material checks

“Local wet-service checks” includes continuous hydrocarbon exposure, accumulation, measured membrane pressure difference, pressure/flow spikes and enhanced robustness. “Known solids or chemical contamination” includes KOH crystals, amines, chlorides and reactive traces. Default material/screening basis is a 316L housing, automatic seal choice and 0.1 µm PTFE membrane; explicitly selecting 0.22 µm uses a modeled 3× membrane gas-throughput reference, not independently certified capacity.

06 Use downstream stages when needed

The fifth panel captures separate downstream risks and local stage details. CF and CLLS require a downstream membrane barrier. A non-electrolyte MMF does not automatically require an additional membrane: provide an independent downstream risk or explicit final-barrier request. Check local Z, gas analysis, liquid quantities, interstage connections, regulator conditions and materials where relevant.

Typical selection routes (examples only)

Contamination mechanism	Typical protection route
Particles / dust	CF-50-P or CF-30 → MF-60 / MF-100, with product chosen by local flow.
Oil / glycol / amine mist	CF-50-C → final membrane, or MCF-100 with integrated coalescing and PTFE membrane.
Wet sample / droplets	MF-100 for manageable duty; MMF-80/150 when higher load or robustness warrants it.
Bulk liquid / slugs	CLLS-30 → MMF-80/150; a further barrier only for an independent residual/downstream risk.
Electrolyzer with KOH/electrolyte	Upstream MMF at take-off, separately routed process sweep/return, independently sized final membrane.
Electrolyzer without electrolyte	Normal contamination-based routing; no automatic MMF.

Filter housing alone does not define duty: CF-50-P and CF-50-C depend on the installed particle/coalescing media. MF, MCF and MMF share a membrane barrier, but provide different upstream separation and liquid-management features.

Calculation and engineering result

07 Calculate and interpret

Click “Calculate & Get Recommendation” to run phase screening, local gas-flow conversion, product selection and engineering checks. A “Protection train” may contain several stages. Review the selected product together with sizing limitations, pressure/temperature conditions, rejected candidates, model assumptions and engineering notes. After any changed input, calculate again: the previous result is marked stale and export is disabled.

Report indication	How to interpret it
GREEN / passed	A specific modeled technical check passes; this is not full-system certification.
Engineering Note	A noncritical missing detail, assumption or engineering observation; not automatically a failed verification.
Engineering advice	Action-oriented recommendation, such as improved sweep or temperature management.
Engineering Review required	A distinct critical issue or operating limit needs resolution before design release.
Condensation risk identified	A liquid phase may form at an assessed stage or under worst-case conditions.
Sample integrity at risk	Condensation or entrained liquids may alter the gas composition presented to the analyzer.

08 Dew points, condensation and heavy ends

Water dew/frost-point and hydrocarbon-phase models are evaluated separately. Determine sample-path temperature targets from the controlling relevant dew point plus the selected margin (default +5 K), at the relevant pressure stages. Incomplete heavy-end characterization remains an information/quality note; it does not by itself downgrade condensation or sample-integrity status. A PTFE membrane blocks free liquid within its validated operating limits; it does not dry water vapor or restore components already lost through condensation.

09 Regulator/JT and sample transport lag

Under “Advanced flow & pressure settings” you may provide regulator heating, measured outlet temperature, line length, internal diameter and optional maximum transport lag. JT screening only covers supported dry feeds and particular CoolProp reference or interpolation ranges; it is indicative, not a general wet-gas or arbitrary natural-gas JT calculation. Measure the regulator outlet temperature when critical. The line-volume / local-flow V/Q estimate is line-only transport lag, not total analyzer response time.

Temperature example

A worst-case dew point of 57.6 °C at a relevant pressure stage and a selected 5 K margin gives a minimum target of about 62.6 °C, unless another stage requires a higher target. Separately verify filter/seal temperature ratings.

PDF report, requests and limits

10 Download, print or reset

“Save / Download Basic PDF” produces the engineering basic report without registration; “Print Result” opens browser printing. Download after the last calculation. “Clear” or “Start New Calculation” begins a new run with defaults. The report records inputs, configuration, phase and temperature evaluation, flow/liquid screening, engineering notes and model limitations.

11 Optional reports, review and quotation

“Request Detailed Engineering Report”, “Request Engineering Review” and “Request Quotation” open an optional contact form. Only these actions ask for name, company, email and consent. The request is designed to carry full application inputs and calculated outputs. Retain any offered “Download Request Record” (JSON) together with the customer PDF.

Delivery status matters: “submitted / receipt unconfirmed” does not confirm receipt in Zoho CRM. Running directly from a local file does not submit a live Zoho request. On error, save the PDF and request record and contact info@analytical-filters.com.

12 Electrolyzers and oxygen-service cases

For identified KOH/other electrolyte exposure, an upstream MMF near sample take-off is selected. Verify the technically permissible electrolyte/process sweep return. A separate final membrane and its sweep are sized independently. FEPE with MaestroInert™ MI-2010-1 is the KOH starting basis; without electrolyte, MI-2010 is the electrolyzer starting basis unless the individual screening says otherwise. Oxygen service requires cleaning/material verification. Above 23 mol-% O_2 without an explicit customer requirement the tool recommends Oxygen Service Cleaning without treating that condition alone as a failed review. H_2/O_2 crossover safety limits are outside its calculation scope.

Checks before final design release

- Verify local actual flows, differential pressure, sweep/return, orientation, maximum temperatures, pressure rating and all worst-case conditions.
- Confirm wetted materials, seals, membrane, any MaestroInert coating and recovery of reactive trace analytes in the complete application.
- The tool does not calculate full piping/valve hydraulics, certified liquid handling capacity, acid dew point or siloxane removal, and is not an ATEX/PED/oxygen-service approval.
- The R8 archive reports local tests; publication to the live website and a real Zoho submission were not demonstrated by the archive.

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