MCP SERVER | NO CODE | CLOUD HOSTED

Amine Treating Unit Design MCP

Calculate precise equipment dimensions and solvent requirements for acid gas removal.

Amine Treating Unit Design MCP gives your AI client the engineering math needed for acid gas removal projects. It handles the heavy lifting for column sizing, solvent flow rates, and regeneration requirements, allowing you to move from gas composition data to equipment specifications without manual calculation errors.

A+ Quality Score 100/100

amine | acid-gas | co2-removal | h2s-removal | process-engineering

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vinkius.com/en/ai-agent-connect/amine-treating-unit-design

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

Amine Treating Unit Design MCP

4 tools available
Cloud-hosted on Vinkius

You can use this MCP to automate the core calculations required for designing amine-based acid gas removal systems. Instead of manually running mass balances or sizing formulas, you provide your agent with gas flow rates, concentrations, and solvent types. The MCP then outputs specific dimensions for absorbers and strippers, determines the necessary circulation rates, and calculates reboiler duties. It also helps you monitor solvent quality by assessing how contaminants like heat stable salts affect your design. This makes it a practical tool for process engineers who need to quickly iterate on unit designs or verify existing specifications.

Core Capabilities

01 — Column Sizing

Your agent calculates the diameter and height of absorbers and strippers.

02 — Flow Rate Calculation

The MCP determines the exact amine circulation needed for specific gas loads.

03 — Solvent Analysis

It evaluates how contaminants like heat stable salts change your design parameters.

04 — Energy Estimation

Your agent can find the reboiler duty required for regeneration.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/en/ai-agent-connect/amine-treating-unit-design** — connect your AI agent in three steps.

01 Connect your preferred client like Claude or Cursor to Vinkius.

02 Provide your gas flow, concentration, and solvent data to your agent.

03 The agent calls the specific design tools within the MCP.

04 The MCP returns calculated dimensions, rates, or energy requirements.

05 You use these results to finalize your engineering documentation.

Connecting this MCP to your AI client gives your agent immediate access to specialized engineering formulas.

Built For

This MCP is built for professionals working in gas processing and chemical engineering.

Process Engineer

Hands off mass balance and equipment sizing tasks to the agent.

Plant Designer

Uses the tool to generate preliminary equipment specifications.

Operations Engineer

Checks solvent health and circulation requirements against real-world data.

What Changes When You Connect

01 Reduces manual calculation errors in column sizing.

02 Speeds up the iteration of amine solvent selection.

03	Provides direct equipment dimensions from gas composition inputs.
04	Links solvent contamination levels to design capacity.

Real-World Applications

Initial Unit Design

Generate first-pass dimensions for an absorber based on a new gas stream.

Solvent Optimization

Determine how changing amine types affects the required circulation rate.

Contamination Assessment

Check how heat stable salts in the solvent will impact the stripper design.

Energy Requirement Checks

Calculate the reboiler duty needed for a specific stripper configuration.

4 Tools Available

#	TOOL	DESCRIPTION
01	`get_circulation_rate`	This tool calculates the specific amine flow required to hit your acid gas removal targets based on gas composition.
02	`design_stripper`	Use this to determine the physical dimensions and operational requirements for the regeneration column.
03	`evaluate_solvent_health`	This tool assesses how contaminants in the solvent impact your design and capacity.
04	`design_absorber`	This tool provides the physical dimensions for the absorption column based on your process parameters.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U Calculate the required amine circulation rate for a gas flow of 1000 m3/h with 5% acid gas concentration using MDEA and a loading of 0.4.

The required circulation rate is 125.5 m3/h with a lean loading of 0.1 and a rich loading of 0.4.

U What are the dimensions for an absorber using a circulation rate of 125.5 m3/h and a gas flow of 1000 m3/h with MDEA?

The absorber will have a diameter of 1.2 meters, a height of 8.5 meters, and will require 20 trays.

U How much reboiler duty is needed for a stripper with a circulation rate of 125.5 m3/h using DEA and 0.01 HSS concentration?

The required reboiler duty is 4.2 MW.

Frequently Asked Questions

01 **What can this MCP calculate for amine units?**

It calculates circulation rates, absorber and stripper dimensions, reboiler duty, and solvent health impacts.

02 **Which AI clients can use this MCP?**

You can use this with any MCP-compatible client, including Claude, Cursor, Windsurf, and VS Code.

03 **Does this MCP handle different types of amines?**

Yes, the tools work with various amine types like MDEA and DEA for your calculations.

04 **How does it handle solvent contaminants?**

The evaluate_solvent_health tool specifically assesses how contaminants like heat stable salts affect your design.

05 **Do I need to host the MCP myself?**

No, Vinkius hosts and manages the MCP for you, so it is ready to use immediately after connection.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"amine-treating-unit-design": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

Amine Treating Unit Design is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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DOCUMENT INFORMATION

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Platform	Vinkius Cloud for AI Agents
Endpoint	`https://edge.vinkius.com/{token}/mcp`

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