

M C P S E R V E R

N O C O D E

C L O U D H O S T E D

Carbon Adsorption Design MCP

Build precise gold recovery circuits with engineering-grade calculations.

Carbon Adsorption Design MCP provides the specialized math needed to engineer carbon adsorption circuits for gold recovery. Your AI client uses these tools to handle everything from vessel sizing to predicting gold uptake based on adsorption isotherms. It turns complex mining engineering formulas into direct, actionable data for your circuit design.

A+ Quality Score 100/100

gold-recovery

adsorption

carbon-design

mining-engineering

isotherm-modeling



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.

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.

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.

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

Encryption at rest

Ed25519

PKI vault signatures

24h TTL

Ephemeral session keys

V8 Isolate

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.

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.

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.

06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot 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.

FinOps

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

Firewall & DLP

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

Agent Activity

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

Tool Health

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

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.

Carbon Adsorption Design MCP

4 tools available

Cloud-hosted on Vinkius

You can now run complex gold recovery calculations directly within your AI client. This MCP handles the heavy lifting for carbon adsorption circuit design, moving you from raw process parameters to a complete engineering model. Instead of manually solving for mass balance or vessel volumes, you ask your agent to run the numbers.

It covers the full spectrum of circuit design. You can determine the exact mass of activated carbon needed for a specific throughput or size your adsorption tanks based on contact time and holdup. The tools also handle the kinetic side of the process, such as calculating how fast you need to replenish carbon to keep the circuit efficient. If you need to model how much gold will actually stick to your carbon at equilibrium, the isotherm modeling tools provide those predictions. It is a specialized toolkit for mining engineers who want to move faster from concept to technical specification.

Core Capabilities

01 — Mass Balance Calculations

Your agent calculates the total carbon mass required for specific gold concentrations and flow rates.

02 — Vessel Sizing

The AI determines the necessary tank volumes based on contact time and solution holdup.

03 — Kinetic Modeling

Your client calculates replenishment rates to maintain circuit efficiency.

04 — Equilibrium Prediction

The MCP uses adsorption isotherms to predict gold loading on carbon.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/carbon-adsorption-design — connect your AI agent in three steps.

- 01 Connect your client like Claude or Cursor to the Vinkius platform.
- 02 Provide your process parameters like throughput, concentration, or contact time.
- 03 The AI invokes the specific engineering tool needed for the calculation.
- 04 Your agent receives the calculated results and presents them in your chat.

You connect your AI client to the Vinkius hosted MCP and start running engineering queries.

Built For

This MCP is built for professionals designing or optimizing gold recovery systems.

Mining Engineers

They hand off circuit sizing and mass balance tasks to the AI.

Process Engineers

They use the tool to model carbon replenishment and isotherm loading.

Metallurgical Consultants

They use the calculations to validate circuit designs for clients.

What Changes When You Connect

01	Reduces manual calculation errors in circuit design.
02	Speeds up the transition from process parameters to vessel specifications.
03	Provides consistent isotherm modeling for gold uptake predictions.

Real-World Applications

Initial Circuit Design

Calculate the required carbon inventory and tank volumes for a new gold recovery plant.

Capacity Planning

Predict how changes in feed concentration will affect gold loading on the carbon.

Operational Optimization

Determine the advance rate needed to maintain efficiency in an existing circuit.

Equipment Specification

Get precise tank dimensions based on required contact times and throughput.

4 Tools Available

#	TOOL	DESCRIPTION
01	calculate_advance_rate	This tool calculates the replenishment or movement speed required to keep your carbon circuit running at peak efficiency.
02	calculate_carbon_inventory	Use this to find the total mass of activated carbon your circuit needs to operate.
03	design_tank_dimensions	This tool determines the physical volume and sizing required for your adsorption vessels.
04	predict_isotherm_loading	This tool models gold uptake to predict how much gold will be on the carbon at equilibrium for a specific concentration.

See It in Action

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

U How much carbon do I need for a throughput of 100 m³/h with 5 mg/L gold and a capacity of 10 mg/g?



The required carbon inventory is 50 kg with a safety factor of 1.2, totaling 60 kg of carbon.

U What size tank is needed for 50 m³/h throughput with a 2-hour contact time and 40% carbon holdup?



The required total tank volume is 250 m³, consisting of 150 m³ of solution and 100 m³ of carbon.

U Predict the gold loading for a feed concentration of 2 mg/L with an isotherm constant of 0.5.



The predicted equilibrium gold loading is 1.0 mg/g.

Frequently Asked Questions

01 What kind of engineering calculations does this MCP perform?

It performs carbon inventory calculations, tank dimension sizing, replenishment rate modeling, and gold isotherm loading predictions.

02 Which AI clients can I use with this MCP?

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

03 Do I need to host the MCP myself?

No, Vinkius hosts and manages the MCP for you. You just connect your client and it is ready to use.

04 Can I use this for gold recovery design?

Yes, the tools are specifically designed for carbon adsorption circuits used in gold recovery processes.

05 How does the tool handle tank sizing?

The design_tank_dimensions tool calculates the necessary volume by looking at your throughput, contact time, and carbon holdup.

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 <code>"carbon-adsorption-design": { "url": "..." }</code>
 Windsurf	MCP Settings → <code>mcp_settings.json</code> → 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

Carbon Adsorption 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

INDEPENDENT PLATFORM DISCLAIMER

Vinkius is an independent platform and is not affiliated with, endorsed by, sponsored by, verified by, or otherwise authorized by Carbon Adsorption Design. All third-party trademarks, logos, and brand names are the property of their respective owners. Their use in this document is strictly for informational purposes to identify service compatibility and interoperability.

DOCUMENT INFORMATION

Generated	September 2026
MCP Server	Carbon Adsorption Design MCP
Server ID	01a084f4-fdce-7184-900c-bfbd7824759a
Platform	Vinkius Cloud for AI Agents
Endpoint	https://edge.vinkius.com/{token}/mcp

LICENSE & USAGE

This document is generated automatically by the Vinkius PDF Engine. Content reflects the MCP server configuration at the time of generation and may change as updates are deployed. For the most current information, visit vinkius.com/en/ai-agent-connect/carbon-adsorption-design.