

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

Catalytic Reformer Design Suite MCP

Optimize reactor configurations and maximize high-octane gasoline yields.

Catalytic Reformer Design Suite MCP gives your AI agent the technical tools needed to design and optimize catalytic reforming units. You can determine reactor setups, predict chemical outputs like hydrogen yield, estimate catalyst life, and adjust operating conditions to hit specific octane targets based on naphtha feed properties.

A+ Quality Score 100/100

naphtha

gasoline

hydrogen

catalyst

reforming



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.

Catalytic Reformer Design Suite MCP

4 tools available

Cloud-hosted on Vinkius

You can now bring heavy chemical engineering calculations directly into your AI client. This MCP bridges the gap between raw naphtha feed properties and the final production of high-octane gasoline. Instead of manually running separate simulation models, you use your agent to handle the heavy lifting of reactor design and process optimization.

When you're working with specific feedstocks, you can use this MCP to determine the best physical and operational setup for your reforming unit. It handles the math for predicting chemical yields and helps you figure out how long your catalyst will stay active before you need to plan a regeneration cycle. If your current yields aren't hitting the mark, you can ask your agent to suggest specific temperature or pressure adjustments to reach a target Research Octane Number (RON) or to increase hydrogen production. It's a direct way to turn feedstock data into actionable unit configurations.

Core Capabilities

01 — Reactor Configuration

Your agent uses this to set up the physical parameters of the reforming unit.

03 — Catalyst Life Tracking

Your agent estimates the time remaining before a catalyst requires regeneration.

02 — Yield Prediction

The AI calculates expected chemical outputs like hydrogen and gasoline components.

04 — Parameter Optimization

The AI suggests temperature and pressure changes to meet specific octane or byproduct goals.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/catalytic-reformer-design-suite — connect your AI agent in three steps.

- 01 Subscribe to the MCP on Vinkius.
- 02 Connect your preferred client like Claude or Cursor with one click.
- 03 Provide your naphtha feed properties or target RON to your agent.
- 04 The agent uses the specific design or optimization tools to generate results.

Setting up this MCP takes seconds, and once connected, your AI client can run engineering calculations immediately.

Built For

This MCP is built for professionals managing refinery processes and reactor performance.

Chemical Engineers

They use the MCP to run rapid design iterations and optimize unit parameters.

Process Engineers

They hand off feedstock data to the agent to get optimized operating conditions.

Refinery Managers

They use the catalyst life estimates to plan maintenance and regeneration schedules.

What Changes When You Connect

- 01 Connects naphtha feed properties directly to reactor design outputs.
- 02 Provides specific temperature and pressure adjustments for target RON.

-
- 03** Calculates hydrogen yield based on reactor volume and configuration.
-
- 04** Estimates regeneration timing to assist in maintenance planning.
-

Real-World Applications

Targeting Octane Levels

You can ask your agent to adjust pressure or temperature to reach a specific Research Octane Number.

Maintenance Planning

Predict catalyst activity duration to schedule regeneration cycles without guesswork.

Hydrogen Maximization

Use the optimization tools to find the best conditions for increasing hydrogen byproduct yield.

Initial Unit Design

Define reactor counts and volumes for new or modified reforming configurations.

4 Tools Available

#	TOOL	DESCRIPTION
01	calculate_yield_and_products	This tool predicts the chemical output of the reforming process. It calculates what you'll get out of the unit based on your current setup.
02	design_reformer_configuration	Use this to determine the physical and operational setup of your reforming unit. It defines the reactor arrangement and basic parameters.
03	estimate_regeneration_cycle	This tool predicts how long your catalyst remains active. It helps you plan for the next regeneration before activity drops too low.
04	optimize_operating_conditions	This tool suggests adjustments to temperature or pressure. You use it to hit a specific RON target or to maximize a particular byproduct.

See It in Action

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

- U** Design a configuration for a naphtha feed with 40% naphthenes and 30% paraffins, targeting a RON of 95 using a platinum-based catalyst in semi-regenerative mode.



The designed configuration includes 3 reactors with a total volume of 45m³, operating at a target temperature of 510°C and a pressure of 15 bar.

- U** What will be the hydrogen yield for a configuration with 2 reactors and 20m³ volume per reactor?



The predicted hydrogen yield for this configuration is 3.2 wt%.

- U** How long will the catalyst last in a semi-regenerative unit with this configuration?



The estimated regeneration cycle length is 450 days.

Frequently Asked Questions

01 What AI clients can I use with this MCP?

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

02 Do I need to host the MCP myself?

No, Vinkius hosts and manages the MCP for you. You just connect and start using the tools.

03 Can this MCP help with hydrogen production?

Yes, you can use the optimization tools to suggest conditions that maximize hydrogen yield.

04 How does it handle catalyst life?

The estimate_regeneration_cycle tool predicts how long the catalyst stays active based on your configuration.

05 Can I target a specific Research Octane Number (RON)?

Yes, the optimize_operating_conditions tool suggests temperature and pressure changes to hit a target RON.

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>"catalytic-reformer-design-suite": { "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

Catalytic Reformer Design Suite 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 Catalytic Reformer Design Suite. 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	Catalytic Reformer Design Suite MCP
Server ID	01a09702-d1e0-7373-b7aa-63a9d5bffa4b
Platform	Vinkius Cloud for AI Agents
Endpoint	<code>https://edge.vinkius.com/{token}/mcp</code>

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/catalytic-reformer-design-suite.