

MCP SERVER

NO CODE

CLOUD HOSTED

Corrosion Rate Monitoring MCP

Keep refinery assets safe with real-time corrosion data.

Corrosion Rate Monitoring MCP gives your AI agent the ability to manage refinery asset integrity. It handles the heavy lifting of calculating metal loss, predicting how much life is left in your equipment, and determining when you actually need to schedule inspections based on real-time probe data.

A+ Quality Score 100/100

refinery

corrosion

maintenance

asset-integrity

monitoring



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.

Corrosion Rate Monitoring MCP

4 tools available

Cloud-hosted on Vinkius

Managing refinery assets requires constant vigilance over metal loss and material degradation. This MCP gives your AI client the specific tools needed to monitor corrosion in real time. Instead of manually crunching numbers from probes, you can ask your agent to calculate current corrosion rates or estimate how much time remains before a vessel hits its minimum safe thickness. It helps you move from reactive repairs to proactive maintenance by predicting service life and determining the best timing for physical inspections. You can also check if your current materials can handle specific process conditions, like high temperatures or H₂S presence, before problems start. It turns your AI into a technical partner that understands the physical realities of your refinery equipment.

Core Capabilities

01 — Real-time metal loss calculation

Your agent uses probe data to find the exact corrosion rate happening right now.

02 — Service life forecasting

The AI predicts when equipment will reach its minimum safe thickness limits.

03 — Material compatibility checks

Your agent verifies if materials can withstand specific temperatures and chemical concentrations.

04 — Inspection timing

The AI determines the optimal window for physical inspections to maintain safety.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/corrosion-rate-monitoring — connect your AI agent in three steps.

- 01 Connect your AI client to Vinkius with one click.
- 02 Provide your probe data or process conditions to your agent.
- 03 The agent calls the specific tool needed for the calculation.
- 04 You receive precise technical answers for your asset management tasks.

Getting this MCP running in your AI client takes seconds.

Built For

This MCP is built for professionals managing high-stakes industrial assets where corrosion control is a safety priority.

Corrosion Engineers

They hand off probe data to the AI to get instant rate calculations and life estimates.

Asset Integrity Managers

They use the AI to plan inspection schedules and monitor equipment health across the refinery.

Maintenance Planners

They rely on the AI to predict when equipment needs replacement or repair.

What Changes When You Connect

- 01 Calculates corrosion rates using real-time probe data.
- 02 Predicts equipment life based on minimum thickness limits.
- 03 Determines inspection timing to ensure safety compliance.

04 Verifies material suitability for specific process environments.

Real-World Applications

Predictive Maintenance

Use the AI to forecast when a vessel will reach its safety limit so you can plan repairs ahead of time.

Real-time Monitoring

Feed probe data into your agent to get immediate updates on how fast metal is being lost.

Process Change Management

Check if your current materials can handle new process conditions like higher temperatures or different chemical concentrations.

Safety Compliance

Automate the calculation of optimal inspection intervals to keep your facility within safety margins.

4 Tools Available

#	TOOL	DESCRIPTION
01	assess_material_suitability	This tool checks if a specific material can handle your current process conditions. It evaluates whether the material is appropriate for the temperature and chemical environment.
02	calculate_current_corrosion_rate	This tool determines the instantaneous corrosion rate. It uses real-time probe data and environmental conditions to find the current metal loss.
03	determine_inspection_schedule	This tool calculates the best time for your next physical inspection. It uses safety requirements to ensure you don't miss a critical check.
04	estimate_remaining_life	This tool predicts how much time is left before equipment reaches its minimum safe thickness. It uses current thickness and corrosion rates to forecast the end of service life.

See It in Action

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

U What is the current corrosion rate if the probe shows 0.5mm loss over 30 days at 150C with a species concentration of 5?



The calculated corrosion rate is 6.05 mm/year.

U How much life is left in a vessel with 25mm thickness, a minimum safety limit of 15mm, and a corrosion rate of 0.5mm/year?



The estimated remaining life is 20 years.

U Is Carbon Steel suitable for 250C with H2S present?



The material is not suitable for these conditions, and the risk level is High.

Frequently Asked Questions

01 What AI clients can use this MCP?

You can use this MCP with any compatible client like Claude, Cursor, Windsurf, or VS Code.

02 How does the corrosion rate get calculated?

The tool uses real-time probe data and environmental conditions to determine the instantaneous rate of metal loss.

03 Can I use this to check material safety?

Yes, the `assess_material_suitability` tool evaluates if a material is appropriate for your specific process conditions.

04 Does this help with maintenance planning?

Yes, it helps you determine the optimal timing for physical inspections and estimate the remaining life of your equipment.

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 you connect.

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>"corrosion-rate-monitoring": { "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

Corrosion Rate Monitoring 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	<code>https://edge.vinkius.com/{token}/mcp</code>

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