MCP SERVER | NO CODE | CLOUD HOSTED

Crude Oil Assay Analysis MCP

Run complex petroleum calculations directly within your AI client.

Crude Oil Assay Analysis MCP gives your AI agent the mathematical tools needed for refinery planning and crude characterization. It handles everything from feedstock classification to yield distribution and blend compatibility checks, turning raw TBP data into actionable refinery insights.

refinery | crude-oil | distillation | yield-analysis | blending

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vinkius.com/en/ai-agent-connect/crude-oil-assay-analysis

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.

Crude Oil Assay Analysis MCP

4 tools available
Cloud-hosted on Vinkius

You can now bring heavy petroleum math into your AI workflow. This MCP gives your agent the ability to process crude oil data and predict how different feedstocks will behave in a refinery setting. Instead of manually calculating yields or checking blend specs, you can hand raw data to your AI client and let it run the numbers for you.

Whether you are working with TBP distillation data or trying to predict how a new crude will impact your product qualities, this MCP provides the specific tools to do it. You can categorize feedstock using get_crude_classification, estimate product volumes through calculate_yield_distribution, and predict refined properties with estimate_product_qualities. If you need to know if a specific mix of crudes will hit your target specs, evaluate_blend_compatibility handles the verification. It turns your AI from a simple text generator into a technical tool for refinery planning and crude characterization.

Core Capabilities

01 — Feedstock Classification

Your agent uses this to label crude types based on gravity and sulfur levels.

02 — Yield Estimation

The AI calculates expected product volumes from distillation data.

03 — Quality Prediction

Your agent predicts refined product properties from raw crude inputs.

04 — Blend Verification

The AI checks if a crude mixture meets specific target requirements.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/en/ai-agent-connect/crude-oil-assay-analysis** — connect your AI agent in three steps.

01 Connect your AI client to the Vinkius hosted MCP.

02 Provide your crude oil data or TBP curves to your AI agent.

03 Ask the agent to perform a specific calculation like yield or classification.

04 The agent uses the MCP tools to process the data and return the result.

Connect your AI client to Vinkius and start running petroleum calculations immediately.

Built For

This MCP is built for professionals working in refinery planning and petroleum engineering.

Refinery Planner

Hands off crude assay data to the AI to run yield and blend simulations.

Petroleum Engineer

Uses the AI to quickly classify new feedstocks and predict product qualities.

Crude Trader

Leverages the tool to check if a potential crude purchase fits existing blend specs.

What Changes When You Connect

01 Automates petroleum math within your existing AI chat interface.

02 Reduces manual calculation errors in yield and quality estimation.

03 Speeds up the crude blending verification process.

04 Provides instant classification for new feedstock samples.

Real-World Applications

Refinery Yield Modeling

Input TBP data to see how much naphtha or diesel a specific crude will produce.

Crude Blending

Check if a new crude addition will push your blend outside of sulfur or viscosity limits.

Feedstock Screening

Quickly categorize incoming crude shipments as light, heavy, sweet, or sour.

Product Quality Forecasting

Predict the sulfur and viscosity of refined products before you even process the crude.

Patterns to Avoid

Manual Yield Guessing

AVOID

You try to estimate how much diesel you'll get from a new crude by just looking at a spreadsheet of distillation numbers.

✓ INSTEAD

Let the agent do the math using `calculate_yield_distribution` to get precise volume estimates from your TBP data.

Blind Blending Decisions

AVOID

You add a new crude to your current inventory without checking if the sulfur levels will spike too high.

✓ INSTEAD

Run a check with `evaluate_blend_compatibility` to ensure the final mix stays within your target specs.

Vague Feedstock Labeling

AVOID

You label a new shipment as heavy based on a quick glance at the density report.

✓ INSTEAD

Use `get_crude_classification` to get an objective label based on API gravity and sulfur content.

The Right Fit

Refinery planners and petroleum engineers should connect this MCP to automate technical calculations. Crude traders can also use it to vet potential purchases. If your work doesn't involve calculating yields, predicting product qualities, or managing crude blends, you don't need this tool.

Crude Oil Assay Analysis: 4 Specialized Petroleum Tools

These tools handle the heavy lifting for refinery math, from feedstock classification to complex yield and blend simulations.

#	TOOL	DESCRIPTION
01	`estimate_product_qualities`	This tool predicts refined product properties. It uses crude characteristics to estimate things like sulfur content or viscosity.
02	`evaluate_blend_compatibility`	This tool verifies if mixing different crude oils will meet your target specifications. It checks if the resulting blend stays within required limits.
03	`get_crude_classification`	This tool categorizes crude oil feedstock. It uses API gravity and sulfur content to label crudes as light, heavy, sweet, or sour.
04	`calculate_yield_distribution`	This tool calculates product volumes from TBP data. It uses distillation curves to estimate how much of each cut will be produced.

See It in Action

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

U Classify a crude with 32 API gravity and 0.5% sulfur content.

The crude is classified as Light/Sweet.

U What is the yield distribution for this TBP data: [{'temp': 100, 'vol': 10}, {'temp': 200, 'vol': 40}] with cuts [{'name': 'Naphtha', 'startTemp': 50, 'endTemp': 150}]?

The Naphtha yield is 10%.

U Predict qualities for crude with 30 API, 2.0% sulfur, and 15 cSt viscosity.

The estimated sulfur in distillates is 1.2% and the estimated viscosity index is 85.

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 your client and start working.

03 **Can this MCP handle TBP distillation data?**

Yes. You can provide TBP data to the calculate_yield_distribution tool to estimate product volumes.

04 **How does the tool classify crude oil?**

The get_crude_classification tool uses parameters like API gravity and sulfur content to categorize the feedstock.

05 **Can I use this to check if a blend is valid?**

Yes. The evaluate_blend_compatibility tool is designed to verify if a crude mix meets your target specifications.

06 **What can I calculate with this server?**

You can classify crude oil types, estimate product yields from distillation curves, predict product qualities, and check if crude blends meet specific targets.

07 **How do I provide TBP data?**

TBP data should be provided as a JSON string containing objects with temperature and cumulative volume percentage.

08 **Can I check if a blend is compatible?**

Yes, use the blend evaluation tool to determine if mixing two crudes will satisfy your target API, sulfur, or viscosity limits.

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 `"crude-oil-assay-analysis": { "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

Crude Oil Assay Analysis 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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