

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

Fuel Oil Blend Calculator MCP

Predict physical and chemical properties of heavy fuel oil blends.

Fuel Oil Blend Calculator MCP gives your AI client the technical math needed for heavy fuel oil blending. It uses non-linear blending indices to predict density, sulfur content, and viscosity. You can also check for physical compatibility to prevent sludge and generate compliance reports for standards like IMO 2020.

A+ Quality Score 100/100

fuel-oil

blending

viscosity

sulfur

compliance



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.

Fuel Oil Blend Calculator MCP

4 tools available

Cloud-hosted on Vinkius

You can now give your AI agent the ability to handle complex heavy fuel oil calculations. Instead of manually running formulas for density or sulfur content, you just provide the component data. This MCP handles the non-linear blending math to give you accurate predictions for your proposed blends. It helps you avoid the headache of sludge formation by checking if your components are physically compatible before you mix them. You can also adjust for temperature changes to see how viscosity will shift in real-time. When you need to verify that a blend meets regulatory requirements like IMO 2020, the MCP generates the necessary compliance reports. It turns your AI client into a specialized engineering tool for fuel management.

Core Capabilities

01 — Property Prediction

The AI calculates density, sulfur, and viscosity using non-linear indices.

02 — Stability Analysis

The AI checks if different fuel components will mix without forming sludge.

03 — Thermal Adjustments

The AI predicts viscosity changes based on specific temperature shifts.

04 — Regulatory Verification

The AI compares blend data against standards like IMO 2020.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/fuel-oil-blend-calculator — connect your AI agent in three steps.

- 01 Connect your preferred MCP-compatible client to Vinkius.
- 02 Provide the component properties like density, sulfur, and viscosity to your AI agent.
- 03 Ask the agent to calculate properties, check compatibility, or predict viscosity.
- 04 Receive precise technical results or compliance reports directly in your chat interface.

Connect the MCP to your AI client and start running technical queries immediately.

Built For

This MCP is built for professionals managing heavy fuel oil logistics and technical specifications.

Fuel Engineers

They hand off component data to the AI to run quick blend simulations.

Marine Engineers

They use the AI to check fuel compatibility and viscosity for engine safety.

Compliance Officers

They use the AI to generate reports that verify fuel meets regulatory standards.

What Changes When You Connect

- 01 Reduces manual calculation errors in non-linear blending math.
- 02 Prevents sludge formation by identifying incompatible fuel components.
- 03 Speeds up regulatory reporting for IMO 2020 compliance.

04 Provides instant viscosity adjustments for different operating temperatures.

Real-World Applications

Pre-blend Testing

Test a theoretical blend of multiple oils to see if it meets density and sulfur targets before physical mixing.

Temperature Modeling

Predict how a specific fuel blend will behave when heated to operating temperatures.

Sludge Prevention

Run a compatibility check on two different fuel batches to ensure they won't cause stability issues.

Regulatory Auditing

Generate a compliance report to prove a fuel blend adheres to technical specifications.

4 Tools Available

#	TOOL	DESCRIPTION
01	calculate_blend_properties	This tool calculates the primary physical characteristics of your proposed fuel oil blend.
02	check_blend_compatibility	Use this to determine if the components you are mixing are physically compatible.
03	get_blend_compliance_report	This tool compares your calculated blend properties against specific regulatory or technical standards.
04	predict_viscosity_at_temperature	This tool predicts how the viscosity of your blend will change when you adjust the temperature.

See It in Action

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

- U** Calculate the properties for a blend of 60% component A (density 980, sulfur 0.5, viscosity 380) and 40% component B (density 950, sulfur 1.2, viscosity 500).



The calculated blend density is 968 kg/m³, the sulfur content is 0.78%, and the blend viscosity is 412 cSt.

- U** Is a blend of two oils with densities 950 and 1020 and viscosities 100 and 600 compatible?



The blend has a High risk level due to significant differences in density and viscosity between the components.

- U** What will the viscosity be if I increase the temperature by 20 degrees for this blend?



The predicted viscosity after a 20 degree temperature increase is 185 cSt.

Frequently Asked Questions

01 What kind of fuel does this MCP calculate?

This MCP is specifically designed for heavy fuel oil blending and technical property prediction.

02 Can I use this with Claude or Cursor?

Yes, you can connect this MCP to any MCP-compatible client including Claude, Cursor, and Windsurf.

03 How does it handle non-linear blending?

The MCP uses non-linear blending indices to predict properties like density and viscosity accurately.

04 Does it help with IMO 2020 compliance?

Yes, it includes a tool to generate compliance reports against regulatory standards like IMO 2020.

05 Can it predict viscosity changes?

Yes, the `predict_viscosity_at_temperature` tool calculates how viscosity shifts when you change the temperature.

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>"fuel-oil-blend-calculator": { "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

Fuel Oil Blend Calculator 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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