MCP SERVER | NO CODE | CLOUD HOSTED

Bottom Contour Analysis MCP

Predict how board shapes affect water flow and performance.

Bottom Contour Analysis MCP gives your AI client the ability to run hydrodynamic simulations on surfboard designs. You can test how different concaves and transitions impact speed, lift, and turning agility before you ever cut foam. It turns your agent into a specialized hydrodynamics consultant for board shaping and design.

A+ Quality Score 100/100

surfboard | hydrodynamics | design | performance | physics

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vinkius.com/en/ai-agent-connect/bottom-contour-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.

Bottom Contour Analysis MCP

4 tools available
Cloud-hosted on Vinkius

Designing a surfboard is a game of managing water flow. This MCP lets you hand off the heavy physics calculations to your AI client. Instead of guessing how a single concave will feel compared to a double concave, you can run specific tests to see how the water actually moves. You can check how much lift a specific shape generates at different speeds or see if a transition between contours will cause too much turbulence. It's a way to validate your design logic using physics-based metrics. Whether you are tweaking a high-performance shortboard or a cruiser, you can use these tools to predict planing thresholds and rail-to-rail transitions. It moves the design process from intuition to data-driven modeling.

Core Capabilities

01 — Hydrodynamic Modeling

Your agent uses this to calculate how water interacts with specific board shapes.

02 — Performance Prediction

The AI uses this to estimate speed and lift based on bottom contours.

03 — Flow Disruption Analysis

Your client uses this to identify turbulence caused by shape transitions.

04 — Design Optimization

The AI suggests changes to improve how a board handles turns.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/en/ai-agent-connect/bottom-contour-analysis** — connect your AI agent in three steps.

01 Connect the MCP to your client like Claude or Cursor via Vinkius.

02 Describe your board's bottom contour to your AI agent.

03 Ask the agent to run specific performance or lift calculations.

04 Review the physics-based results to refine your design.

Connecting this MCP to your AI client gives it immediate access to hydrodynamic math.

Built For

This MCP is built for people designing high-performance watercraft where fluid dynamics matter.

Surfboard Shapers

They use the AI to validate new bottom contours before shaping.

Hydrodynamic Engineers

They use the tools to run quick simulations on surface flow and lift.

Product Designers

They use the data to refine the performance specs of watercraft designs.

What Changes When You Connect

01 Reduces design errors by predicting turbulence before physical prototyping.

02 Provides specific lift and speed metrics for different board shapes.

03 Speeds up the iterative design process through rapid hydrodynamic testing.

Real-World Applications

Shape Validation

Test if a new concave design will provide enough lift for a specific speed.

Transition Testing

Check if moving from a single to a double concave creates too much water disruption.

Agility Tuning

Get design suggestions to make a board more responsive in turns.

Planing Thresholds

Determine the exact speed at which a specific bottom shape begins to plane.

4 Tools Available

#	TOOL	DESCRIPTION
01	optimize_maneuverability	This tool suggests specific bottom shape adjustments to help the board turn more easily.
02	calculate_lift_profile	Use this to find out how much upward pressure the board generates at specific speeds.
03	evaluate_transition_turbulence	This tool predicts if water flow will get disrupted when moving between different contour shapes.
04	analyze_contour_performance	This tool evaluates the core hydrodynamic metrics for any given bottom configuration.

See It in Action

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

U Analyze a single concave configuration with a V-panel and 5mm channels.

The analysis shows a high speed score and moderate lift, with a stability rating of Medium.

U What happens if I transition from a single concave to a double concave over 10cm?

The transition results in a Turbulent flow level with a flow disruption score of 0.65. A Gradual transition is recommended.

U Calculate the lift for a double concave at a speed of 15 knots with 0.8 channel efficiency.

The total lift is 45.2 units with a planing threshold of 12 knots and a center-focused pressure distribution.

Frequently Asked Questions

01 **What kind of analysis does this MCP perform?**

It performs hydrodynamic analysis focused on surfboard bottom contours, specifically looking at speed, lift, and maneuverability.

02 **Can I use this with Cursor or VS Code?**

Yes, you can use this MCP with any compatible client including Cursor, VS Code, Windsurf, and Claude.

03 **How does it help with board turning?**

The optimize_maneuverability tool suggests specific adjustments to the board bottom to improve turning agility.

04 **Does it predict water turbulence?**

Yes, the evaluate_transition_turbulence tool predicts flow disruption when moving between different contour shapes.

05 **How do I get the results?**

Your AI client will execute the tools and provide you with the calculated metrics, such as lift units or flow disruption scores.

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 `"bottom-contour-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

Bottom Contour 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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DOCUMENT INFORMATION

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Platform	Vinkius Cloud for AI Agents
Endpoint	`https://edge.vinkius.com/{token}/mcp`

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