

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

Board Planing Speed Calculator MCP

Get precise hydrodynamic data for surfboard design and performance.

Board Planing Speed Calculator provides hydrodynamic analysis for surfboard design. Your AI client can calculate the exact speed needed to lift a board out of the water, analyze drag across different speeds, and find the most efficient velocity range for specific fin setups and rocker profiles.

A+ Quality Score 100/100

surfboard

hydrodynamics

planing

drag

physics



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.

Board Planing Speed Calculator MCP

4 tools available

Cloud-hosted on Vinkius

Designing a surfboard requires more than just intuition. This MCP gives your AI agent the ability to run hydrodynamic calculations that determine how a board will actually behave on the water. You can use it to find the threshold speed where a rider begins to plane, which is critical for determining how a board will feel in different wave conditions. Instead of guessing how a new rocker or fin setup might change performance, you can have your agent run comparative analyses to see the impact on drag and efficiency. It handles the physics of resistance and velocity, allowing you to focus on the shape and feel of the board. Whether you are testing a new concave depth or adjusting a fin configuration, this tool provides the mathematical foundation for your design decisions.

Core Capabilities

01 — Planing Threshold Calculation

Your agent calculates the minimum velocity needed to lift the board onto a plane.

02 — Drag Resistance Mapping

The AI maps how resistance changes as the board gains speed.

03 — Configuration Comparison

Your agent compares how different rocker levels or fin setups change the physics of the board.

04 — Efficiency Window Identification

The AI finds the specific velocity range where the board operates most efficiently.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/board-planing-speed-calculator — connect your AI agent in three steps.

- 01 Connect your MCP-compatible client to Vinkius.
- 02 Provide your board dimensions, rider weight, and setup details to your AI agent.
- 03 The agent calls the specific hydrodynamic tool needed for your question.
- 04 The MCP returns precise speed, drag, or efficiency data.
- 05 Your agent presents the results for your design review.

Connecting this MCP to your AI client gives you immediate access to hydrodynamic modeling tools.

Built For

This MCP is built for professionals in the surfboard manufacturing and design industry.

Surfboard Designers

They hand off design parameters to the AI to validate hydrodynamic performance.

Hydrodynamic Engineers

They use the tool to run quick calculations on drag and planing speeds.

Shapers

They use the data to predict how a specific rocker or fin setup will feel on the water.

What Changes When You Connect

- 01 Removes the guesswork from board design by providing mathematical drag profiles.

- 02

Speeds up the iterative design process through rapid configuration comparisons.
- 03

Provides precise velocity data for specific rider weights and board dimensions.

Real-World Applications

Rocker Optimization

Compare how different rocker levels change the minimum planing speed for a specific rider.

Rider Matching

Determine if a specific board design will plane effectively for a given rider weight.

Fin Setup Testing

Evaluate the drag impact of switching from a thruster to a quad fin setup.

Efficiency Analysis

Find the optimal speed range for a new board design to ensure it performs well in various conditions.

4 Tools Available

#	TOOL	DESCRIPTION
01	compare_configurations	This tool evaluates how changing the fin setup or rocker affects planing performance. It lets your agent compare two different board builds side by side.
02	get_drag_profile	This tool analyzes how drag changes across different speed increments for a specific board setup. It provides a clear picture of resistance at various velocities.
03	get_minimum_planing_speed	This tool determines the threshold speed required for the board to begin planing. It identifies the exact moment a rider lifts out of the water.
04	get_optimal_operating_window	This tool identifies the ideal speed range for performance and efficiency. It finds the sweet spot where the board performs best.

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 minimum planing speed for a 75kg rider on a 180cm x 50cm board with a thruster setup, rocker level 4, and concave depth 3?



The minimum planing speed for this setup is 5.2 m/s, with an optimal speed range of 5.5-7.0 m/s and a drag coefficient of 0.045.

U Show me the drag profile for a 80kg rider on a 190cm x 52cm board with rocker level 5.



At 4 m/s, the drag coefficient is 0.03; at 6 m/s, it is 0.05; and at 8 m/s, it is 0.08.

U What is the best speed range for a 70kg rider on a 175cm x 48cm board with a quad fin setup?



The ideal speed range for this board is 5.8 m/s to 7.2 m/s, providing an efficiency rating of 8.5.

Frequently Asked Questions

01 What can this MCP calculate for surfboard design?

It calculates minimum planing speeds, drag profiles, optimal operating windows, and compares different board configurations.

02 Which AI clients can use this MCP?

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

03 How does the tool handle different rider weights?

The tools use the rider's weight as a primary variable to determine planing thresholds and drag coefficients.

04 Can I compare fin setups?

Yes, the `compare_configurations` tool specifically evaluates how changing fin setups impacts performance.

05 Do I need to host the MCP myself?

No, Vinkius hosts and manages the MCP for you, so it is ready to use as soon as you connect your client.

06 How do I calculate the minimum speed for my board?

Use the `get_minimum_planing_speed` tool by providing the rider's weight, board dimensions, fin configuration, rocker level, and concave depth.

07 Can I compare different fin setups?

Yes, the `compare_configurations` tool allows you to compare multiple fin setups and rocker levels against a baseline to see the impact on speed and drag.

08 What is the optimal speed range?

The optimal speed range is the velocity window where the lift-to-drag ratio is maximized. You can find this using `get_optimal_operating_window`.

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>"board-planing-speed-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

Board Planing Speed 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	https://edge.vinkius.com/{token}/mcp

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