MCP SERVER | NO CODE | CLOUD HOSTED

Simple Dilution Mixer MCP for AI Agents

Accurate Chemical Mixing and Solution Formulation

The Simple Dilution Mixer MCP calculates exact volumes of concentrate and solvent for precise liquid mixing in chemistry labs or industrial settings. It helps users determine required amounts, validates concentration safety tiers (low, medium, high), and generates clear, actionable step-by-step recipes for technicians to follow.

A+ Quality Score 100/100

dilution | chemistry | precision | calculation | liquid-mixing

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vinkius.com/mcp/simple-dilution-mixer

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.

Simple Dilution Mixer MCP

3 tools available
Cloud-hosted on Vinkius

Mixing solutions accurately requires more than just guesswork; it demands precision math. This MCP handles the entire process, from initial calculation to final instruction set. You enter your desired target volume and concentration goal, and the system figures out exactly how much concentrate and base liquid you need. Beyond the numbers, it also evaluates the safety of the mix by categorizing its concentration into defined risk tiers. Finally, it builds a clear recipe that any technician can follow immediately. Connecting this MCP through Vinkius gives your AI client instant access to specialized chemical calculation tools, letting you focus on the science instead of the spreadsheets.

Core Capabilities

01 — Determine precise mixing volumes

Input a target volume and concentration, then get specific measurements for both the concentrate and base liquid.

02 — Assess chemical safety tiers

Receive an immediate categorization of a given concentration—low, medium, or high—for safe handling procedures.

03 — Generate step-by-step mixing instructions

Convert calculated volumes and ratios into a clear, actionable procedure that minimizes human error in the lab.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/simple-dilution-mixer** — connect your AI agent in three steps.

01 Tell your AI agent what you need to mix: specify the target final volume and the desired percentage concentration.

02 The MCP calculates the exact required volumes of both the solute (concentrate) and solvent (base liquid), then checks the resulting mixture's safety tier.

03 You receive a detailed, step-by-step recipe that tells your lab team exactly how to combine those measured components.

The bottom line is you get mathematical accuracy for dilution processes without needing manual calculations or cross-referencing safety protocols.

Built For

This MCP serves chemists, quality control engineers, and lab technicians who spend time formulating solutions. If your job involves mixing chemicals—whether in a university research setting or an industrial production line—you'll need this to ensure safety and accuracy.

Research Chemist

Uses it daily to calculate precise volumes for experimental solutions, ensuring the integrity of their test batches.

QC/QA Engineer

Verifies product safety by checking concentrations against defined handling tiers before batch release.

Laboratory Technician

Follows the generated recipes directly, guaranteeing consistent and safe mixing procedures every time.

What Changes When You Connect

01 Accuracy: Automatically determine the correct amounts needed using `calculate_dilution_volumes`, eliminating manual calculation errors when formulating batches.

02 Safety First: Use `validate_concentration_tier` to instantly check if a resulting concentration falls into a safe, medium, or high handling tier.

03 Consistency: Get repeatable results. The generated recipe ensures that every mixing procedure follows the exact same sequence of steps for your technicians.

04 Time Savings: Stop cross-referencing multiple manuals and spreadsheets. Your agent handles volume math and safety checks in one flow.

05 Compliance: Easily document the calculation process, proving exactly how the final solution was mixed and what its calculated risk profile is.

Real-World Applications

Preparing a large-scale buffer solution

A QC engineer needs to make 200 liters of a specific pH buffer. They ask their agent, which uses `calculate_dilution_volumes` to determine the precise amounts needed for both acid and base components. The resulting recipe is then sent directly to the production floor.

Reviewing an unknown chemical sample

A research chemist isolates a new compound and needs to know if it's stable enough for further testing. They run `validate_concentration_tier` on the sample, which instantly flags it as 'High Intensity,' requiring specialized handling protocols.

Training new lab staff

A supervisor needs to teach a junior tech how to mix a standard reagent. They use `generate_dilution_recipe` based on pre-calculated volumes, ensuring the instructions are clear and foolproof for anyone to follow.

Adjusting formulas under pressure

An industrial mixer needs to quickly change a batch formula from 8% to 12%. The agent uses `calculate_dilution_volumes` to instantly provide the necessary adjustments for both solute and solvent, keeping production running smoothly.

Patterns to Avoid

Manual cross-referencing of safety data

✗ AVOID

The user calculates volumes manually in Excel, then has to open a separate safety manual or wiki page to check the risk level for that concentration. This creates delay and potential human error.

✓ INSTEAD

Use `calculate_dilution_volumes` first, and then immediately pass the result through `validate_concentration_tier`. This single flow calculates the mix *and* confirms its safe handling tier automatically.

Mixing ingredients without written procedure

✗ AVOID

Lab techs are told to 'mix X with Y,' leading to variations in technique, order of addition, and inconsistent final products across different shifts.

✓ INSTEAD

Always use `generate_dilution_recipe` after calculating volumes. This forces a standardized, step-by-step protocol that every person on the team must follow.

Ignoring base liquid volume changes

✗ AVOID

A chemist only calculates the solute amount needed but forgets to adjust the solvent (base liquid) for slight variations in final container size or temperature.

✓ INSTEAD

The `calculate_dilution_volumes` tool accounts for both components, giving you reliable volumes for *both* concentrate and base liquid, preventing under- or over-mixing.

The Right Fit

Use this MCP if your workflow requires precise chemical mixing calculations and mandated safety protocol checks. If the core task involves knowing how much of Component A and Component B are required to hit a target volume (e.g., 'I need 10L at 5%'), this is essential. Furthermore, if you need documentation that not only shows the math but also classifies the resulting mixture's risk level, connecting these tools saves time. Don't use this MCP if your task is simply mixing pre-mixed solutions; then a basic inventory tracking tool might suffice. Also, don't rely on it for thermodynamic calculations—it focuses purely on volume and concentration ratios.

Simple Dilution Mixer MCP: Solving Complex Lab Formulation Math

Today, formulating a solution is tedious. You start with raw data sheets, calculate the necessary volumes in Excel, then you have to consult multiple safety guides to classify that mixture's risk level. It’s copy-pasting numbers between spreadsheets and switching tabs just to verify if your resulting concentration is safe enough for storage.

With this MCP, you skip all the spreadsheet work. You ask your agent what's needed, and it doesn't just give you a number; it handles volume calculation and safety validation simultaneously. You get immediate confirmation of both the mix ratio *and* the required handling protocol.

Simple Dilution Mixer MCP: Guaranteeing Standardized Lab Procedures

Without a specialized tool, mixing processes often rely on verbal instructions or poorly formatted SOPs. This leads to variations—some technicians might mix components in the wrong order, or miss a crucial step like 'add slowly.' Consistency suffers.

Now, your AI agent manages this entire process. By generating an explicit recipe using `generate_dilution_recipe`, you enforce one single, repeatable set of instructions for every team member. The procedure is flawless.

Simple Dilution Mixer: 3 Tools for Liquid Chemistry Calculations

These tools allow you to perform calculations, validate safety tiers, and generate detailed instructions for any liquid dilution project.

#	TOOL	DESCRIPTION
01	`calculate_dilution_volumes`	Calculates specific amounts of concentrate and base liquid needed to meet a target dilution goal.
02	`generate_dilution_recipe`	Converts calculated volumes into clear, actionable mixing instructions for lab personnel.
03	`validate_concentration_tier`	Categorizes a target chemical concentration into standard safety and handling tiers (low, medium, high).

See It in Action

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

U I need to prepare 15 gallons of a cleaning solution that must be exactly 4% active ingredient. How much concentrate and water?

Solution Mix Calculation

- **Target Volume:** 15 Gallons (36,000 ml)
- **Concentration Goal:** 4%

COMPONENT	REQUIRED VOLUME
Concentrate	**1.44 Gallons**
Base Liquid	**13.56 Gallons**

This mix is rated as a *Medium* handling tier.

U What's the safety rating for mixing 20 ml of solute into 980 ml of solvent?

Concentration Validation Report

Based on your inputs, the resulting mixture concentration is 2%.

- **Safety Tier:** Low Intensity
- **Handling Protocol:** Standard gloves and eye protection are sufficient.
- **Notes:** This is well within standard operating parameters.

U Write out the steps for mixing 50ml of concentrate with 450ml of water.

Dilution Recipe: Standard Buffer Mix

1. Pour 50 ml of the concentrate into a clean, marked beaker.
2. Slowly add 450 ml of the base liquid over a period of five minutes while stirring constantly.
3. Mix until the solution is uniform and completely colorless.

Yield: 500ml total.

Frequently Asked Questions

01 **Does Simple Dilution Mixer MCP handle complex, multi-step chemical formulations?**

It manages the core math of dilution and concentration assessment. You can accurately determine volumes for multiple components and receive a consolidated safety report based on those measurements.

02 **How do I ensure my lab staff follow the correct mixing order using Simple Dilution Mixer MCP?**

You use its recipe generation tool. It converts your calculations into a clear, numbered list of steps that dictates exactly how and when components must be added to maintain procedural integrity.

03 **What kinds of safety ratings does the Simple Dilution Mixer MCP provide?**

It categorizes concentrations into defined tiers: Low, Medium, or High. This rating is crucial because it tells you instantly what level of personal protective equipment (PPE) and handling procedures are required.

04 **Can I use Simple Dilution Mixer MCP for industrial cleaning solutions?**

Yes. Because it deals with general volume, concentration, and safety protocols, it applies equally well to large-scale industrial formulations as it does to academic research batches.

05 **If the solvent changes, will Simple Dilution Mixer MCP recalculate the volumes?**

Yes. The calculations are dynamic. You simply update your desired target volume or component ratios, and the tool provides the new required amounts for both concentrate and base liquid.

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 `"simple-dilution-mixer": { "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

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

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