



- ZERO-TRUST RUNTIME COMPLIANCE

NanoCompass OS

The Agentic Compliance Firewall

A zero-trust runtime engine that calculates the physical legality of every material payload before an autonomous workforce can act on it.

EU REACH

US TSCA

FDA



THE PROBLEM

Software firewalls miss physical legality.

Traditional AI firewalls stop prompt injections and software exploits. None of them can judge whether a material is legal to source.

TRADITIONAL AI FIREWALL

Guards digital payloads. Blind to molecules.

THE EXPOSURE

EU REACH, US TSCA and FDA statutes apply the moment an agent acts.



WHAT IT DOES

Physical legality, calculated in real time.

NanoCompass OS sits between an autonomous agent and the act of sourcing, evaluating the multi-jurisdictional legality of every payload before any command is dispatched.

● ● ● POST /v1/authorize

```
{  
  "casNumber": "1314-13-2",  
  "nanoformDeclared": true,  
  "jurisdiction": "DE"  
}
```

● 200 ALLOW



CORE CAPABILITIES

Five checks on every payload.

01 Sub-second interception

Evaluates an unstructured agent intent array in under 200 ms.

02 CAS checksum verification

Recomputes the check digit to reject fabricated material identities.

03 Nanoform enforcement

Blocks hidden nano-dimension payloads when particle size is omitted.

04 Geographic isolation

Maps ISO country codes to the cross-border law that applies.

05 Immutable audit trail

Writes every ALLOW and REJECTED event to a persistent ledger.



BUILT FOR RUNTIME

<200ms

to evaluate an unstructured agent intent array and return a binding ALLOW or REJECTED verdict.

Deterministic

No model hallucination

Every event logged

Persistent audit ledger



INTEGRATION

One request. Four fields.

Authenticate with an `x-api-key` header, then describe the material the agent intends to source.

`casNumber`

Registry ID, checksum verified

required

`nanoformDeclared`

Flags engineered nanomaterials

required

`particleSizeNm`

Required once nanoform is true

if nano

`jurisdiction`

ISO alpha-2 destination code

required



VALIDATION IN ACTION

Caught before execution.

400 REJECTED

CAS_CHECKSUM_FAILURE

casNumber: "123-31-5"

The check digit fails recomputation. The identifier is fabricated, so the request never reaches a supplier.

400 REJECTED

NANOFORM_DATA_REQUIRED

particleSizeNm: null

A nanoform was declared without a particle size. The hidden nano-dimension payload is blocked until the data is provided.



THE BOUNDARY

A security proxy, not a legal sign-off.

NanoCompass OS is an automated security layer in front of your autonomous workforce. Final jurisdictional accountability stays with the executing enterprise node.

**Route every sourcing command through
the firewall before dispatch.**