



# ODDC Overview

## ODD Conformance Determination Framework

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**ODDC (ODD Conformance Determination) provides independent, third-party attestation that autonomous systems operate within defined operational boundaries with three-tier enforcement. Boundaries may be specified by the operator or auto-discovered through the ENVELO Interlock’s adaptive learning mode. This document describes the framework components, attestation scope, conformance process, and conformance states.**

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Independent conformance determination. Sentinel Authority is not a regulator. This document does not constitute legal advice or regulatory guidance. Regulatory applicability varies by jurisdiction.

# 1. Introduction

## 1.1 Purpose

ODD Conformance Determination (ODDC) is Sentinel Authority's voluntary conformance framework for autonomous systems. ODDC provides standardized, verifiable evidence of bounded operation that serves as a first-order risk control input for underwriting review of autonomous infrastructure.

## 1.2 Framework Components

Component	Description
ODD	Operational Design Domain — the operational boundaries within which the system operates. May be formally specified by the operator or auto-discovered through adaptive learning.
ENVELO	Enforced Non-Violable Execution-Limit Override — three-tier runtime enforcement: Tier 1 self-correction on ODD approach, Tier 2 Minimum Risk Condition on ODD breach, and Tier 3 hard halt at the ENVELO wall.
CAT-72	Conformance Assurance Test — 72 cumulative hours of system operation verifying enforcement mechanism integrity across representative ODD conditions.

## 1.3 What ODDC Is Not

ODDC explicitly does not constitute:

- Regulatory approval or certification
- Safety certification (e.g., IEC 61508, ISO 26262)
- Product certification or quality mark
- Guarantee of system performance or reliability
- Insurance or warranty of any kind

# 2. Attestation Scope

## 2.1 What ODDC Attests

Upon successful conformance determination, ODDC attests that at the time of determination:

Category	Attestation
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ODD Boundaries	System operates within defined operational boundaries – whether specified by the operator or auto-discovered through adaptive learning and approved by the operator.
Operational Evidence	System demonstrated stable operation within its ODD through 72 cumulative hours of system operation via CAT-72 testing.
ENVELO Enforcement	Three-tier enforcement architecture is present and functional: Tier 1 self-correction, Tier 2 Minimum Risk Condition, Tier 3 hard halt at the ENVELO wall.
Audit Trail	Tamper-evident audit records generated for all enforcement events and tier transitions with cryptographic integrity.
IP Protection	Operator’s source code, model weights, decision logic, and proprietary algorithms are never accessed. The Interlock transmits only operational telemetry.

## 2.2 What ODDC Does Not Attest

- Functional safety of underlying system design
- Regulatory or legal compliance
- Cybersecurity posture or resilience
- System performance, accuracy, or fitness for purpose
- AI model correctness, training data quality, or algorithmic fairness

## 3. Conformance Process

The conformance process supports two paths. Adaptive (default): the ENVELO Interlock observes normal operation, auto-discovers operational boundaries, a Sentinel Authority Conformance Engineer reviews the boundaries, the operator approves, and enforcement begins. Prescriptive: the operator defines boundaries upfront for regulatory or contractual requirements. Both paths follow seven phases:

Phase	Activity	Key Output
1. Inquiry & Eligibility	Initial contact and eligibility screening. System identification and ENVELO implementation approach.	Eligibility determination
2. Formal Application	Formal application submitted with system documentation. ODD specification is optional if using adaptive path.	Application accepted
3. ODD Specification Review	For prescriptive: Sentinel reviews submitted boundaries for minimum specificity. For adaptive: conducted after learning phase.	ODD specification approved
4. ENVELO Deployment & Boundary Review	Interlock deployed. For adaptive path: learning mode runs, boundaries auto-discovered. Conformance Engineer reviews boundaries. Operator approves. Boundaries locked.	Boundaries locked for testing
5. CAT-72 Execution	72 cumulative hours of system operation under active interlock enforcement. Three demonstration phases: continuous operation, stress testing, enforcement proof.	Evidentiary record complete
6. Determination & Attestation	Binary conform / does-not-conform determination. Certificate hash generated and published to public registry.	Certificate issued (or denied)
7. Continued Monitoring	Ongoing ENVELO Interlock operation with continuous conformance monitoring. Renewal testing prior to certificate expiration.	Conformance maintained

### 3.1 Conformance Gates

Five gates must be passed sequentially. Failure at any gate halts the process:

Gate	Requirement
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G1: Eligibility	System is an autonomous system with identifiable operational boundaries. ENVELO implementation is technically feasible.
G2: ODD Specificity	At least one quantitative boundary with measurable threshold, defined unit, and enforcement action. No qualitative-only ODDs.
G3: Boundary Lock	Boundaries reviewed by Conformance Engineer, approved by operator, and locked. No modifications permitted during testing.
G4: CAT-72 Complete	72 cumulative hours completed with zero Tier 3 violations, successful Tier 2 responses, uninterrupted audit chain, and all parameters reporting.
G5: Determination	Binary conform / does-not-conform. No conditional pass. Certificate hash published to registry.

## 4. Conformance States

Systems transition through defined states during the conformance lifecycle:

State	Description	Registry Status
OBSERVE	Interlock connected, learning mode active. Telemetry collected, no enforcement.	Not published
BOUNDED	Boundaries locked, enforcement active, cumulative clock running.	Not published
CONFORMANT	CAT-72 complete, certificate issued, Interlock active and reporting.	CONFORMANT
PAUSED	System not actively operating. Clock paused during testing, or between operational intervals post-certification.	CONFORMANT (if certified)
SUSPENDED	Interlock stops reporting or compliance rate drops below threshold. Automatic – no human intervention required.	SUSPENDED
REVOKED	Remediation not completed within correction window. Permanently visible in registry with reason code.	REVOKED

## 5. Related Documents

Document	Version	Description
ODDC Standard Specification	v1.0	Normative requirements for ODDC conformance
ENVELO Interlock Requirements	v3.0	Three-tier runtime enforcement requirements specification
CAT-72 Procedure	v5.0	Conformance Assurance Test — evidentiary procedure
ODDC Certification Guide	v5.0	Complete process guide from inquiry through continued monitoring
ODDC Scenarios	v3.0	Industry application examples with tiered enforcement
Governance & Independence Statement	v1.0	Structural separation and independence mechanisms
Conformance Agreement	—	Terms and conditions for conformance determination

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