

OLEUM SPEC

# Two Ecosystems, One Classification Objective

*Due ecosistemi, un solo obiettivo di classificazione*

Virgin olive oil classification today requires both regulatory legitimacy and operational efficiency. The official COI Panel Method remains the recognized human sensory reference for organoleptic classification. At the same time, AI-supported instrumental platforms can expand throughput, improve repeatability, and support faster industrial decision-making.

- i The key strategic question is not human versus machine, but how to combine the regulatory authority of the panel with the scalability and consistency of instrumental intelligence. *(La domanda strategica chiave non è uomo contro macchina, ma come combinare l'autorità regolatoria del panel con la scalabilità dell'intelligenza strumentale.)*

# COI Panel Method Ecosystem – Structure & Constraints

*Ecosistema Panel Metodo COI – struttura e vincoli*

1

## Four Critical Activities

Recruiting, training, proficiency/calibration schemes, and ongoing internal quality monitoring – all required by the COI ecosystem.  
*(Reclutamento, addestramento, schemi di proficiency e monitoraggio continuo della qualità interna.)*

2

## COI/T.20/Doc. 14

Defines the framework for selection, training, and quality control of tasters, panel leaders, and trainers. *(Definisce il quadro per selezione, addestramento e controllo qualità di assaggiatori, panel leader e trainer.)*

3

## COI/T.20/Doc. 17

States that both individual tasters and the whole panel must be monitored regularly, as the group of tasters is the measuring instrument. *(Il gruppo di assaggiatori è lo strumento di misura e deve essere monitorato regolarmente.)*

4

## ISO/IEC 17043:2023

Proficiency testing participation is coherent with this standard, which defines requirements for competence and impartiality of proficiency testing providers. *(La partecipazione a proficiency test è coerente con questa norma.)*

# COI Panel Method Ecosystem – Performance Profile

*Ecosistema Panel Metodo COI – profilo prestazionale*

## Structural Requirements

- 8–12 tasters required per test (COI/T.20/Doc. 15)
- Max 4 samples per session, max 3 sessions/day
- Practical ceiling: 12 samples/day per panel
- Dedicated sensory room, standardized glasses (Doc. 5), and dedicated booths (Doc. 6)

## Key Limitations

The COI ecosystem is scientifically robust and officially recognized, but also organizationally heavy, time-intensive, and highly dependent on correct execution of selection, training, alignment, and monitoring procedures (*L'ecosistema COI è scientificamente solido e ufficialmente riconosciuto, ma risulta organizzativamente complesso, dispendioso in termini di tempo e risorse*).

A further critical issue: sensory consistency can drift if panel control weakens, because the measurement system is intrinsically human-dependent. (*La coerenza sensoriale può andare incontro a deriva se il controllo del panel si indebolisce.*)

# OleumSpec Ecosystem – Efficiency by Design

*Ecosistema OleumSpec – efficienza by design*

## ⚡ Up to 35 Samples/Day

Per instrument, with a single non-specialist operator and approximately 2 m<sup>2</sup> of floor space. Immediate output from the processing system.

## 🔄 Stable Repeatability

Unlike human panels, the instrumental platform does not suffer fatigue, interpersonal variability, or day-to-day biological drift. *(Non soffre di fatica, variabilità interpersonale o deriva biologica.)*

## 🤖 AI-Supported Classification

Machine learning and deep learning approaches provide effective category classification support when applied to suitable analytical fingerprints, as shown in scientific literature.

## 🏭 Decision-Support Infrastructure

OleumSpec is not merely a faster instrument – it is a decision-support infrastructure improving speed, repeatability, and resource allocation across the quality chain.



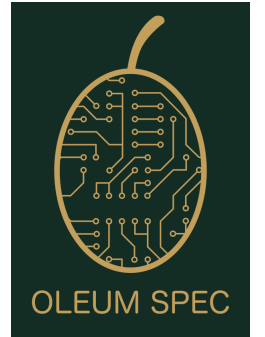
# Comparative Efficiency — Where Each Ecosystem Excels

*Efficienza comparata — dove ciascun ecosistema eccelle*

Parameter	COI Panel Method	OleumSpec
Samples/day	12 practical maximum per panel	35 per instrument
Human resources	8–12 tasters per test	1 non-specialist operator
Response time	Session-based, non-immediate	Immediate
Repeatability	Human-dependent, requires continuous monitoring	Instrument-stable over time
Infrastructure	Dedicated sensory room, booths, standardized glasses	Approx. 2 m²
Main strength	Official sensory classification	Throughput, standardization, decision support
Main risk	Subjectivity, drift if control weakens	Needs positioning as support, not regulatory substitute

✔ Recommended tiered workflow: Use OleumSpec for rapid screening, pre-classification, blend optimization, and anomaly detection — then reserve the official panel for regulatory confirmation, borderline samples, disputes, and sensory validation of strategic decisions. *(Usare OleumSpec per screening rapido e pre-classificazione; riservare il panel per conferma regolatoria e campioni borderline.)*

# Final Message – Tradition Empowered by Intelligence



*Messaggio finale – tradizione potenziata dall'intelligenza*

The future of virgin olive oil classification is not a choice between tradition and innovation, but a controlled integration of both. *(Il futuro non è una scelta tra tradizione e innovazione, ma un'integrazione controllata di entrambe.)*

## Human Sensory Authority

The official panel remains indispensable for regulatory recognition, sensory interpretation, and institutional credibility wherever formal classification is required.

## Instrumental Intelligence

OleumSpec adds what the human system structurally lacks at scale: speed, repeatability, compactness, immediate data processing, and continuous operational support.

## Industry 5.0 Enabler

OleumSpec is a replicable Industry 5.0 enabler for the olive oil sector – where AI becomes an ally of sensory tradition, production sustainability, and better use of human expertise.

Together, the two ecosystems **define a more resilient model for agro-industrial quality management**: human sensory authority for official judgment, instrumental intelligence for scalable execution. *(Autorità sensoriale umana per il giudizio ufficiale, intelligenza strumentale per l'esecuzione scalabile.)*