

# PROVISION1 LABORATORY | TECHNICAL DISCLOSURE

DOCUMENT ID: P1-P4-STIL-2026-V1

SECURITY REGISTRATION: INTERNAL VAULT BASELINE

DOCUMENT TITLE: Spatial Topology Integration Ledger: Deterministic Feature Extraction & Labor Reclamation Metrics

## I. EXECUTIVE SUMMARY: CLOSING THE METROLOGICAL VOID

Industrial pipelines are bottlenecked by the costly manual conversion of raw, uncurated visual assets into structurally valid, edge-snappable CAD/CNC geometry. Conventional tools—whether stochastic generative models or basic raster-to-vector filters—routinely fail on real-world materials. Directional lighting, specular reflections, wood grain, textile weave, and perspective distortion produce fragmented, non-manifold paths that demand hours of manual cleanup.

The Provision1 **Pane 4 Spatial Topology Kernel** eliminates this friction. Operating entirely in the raster domain through a deterministic, non-stochastic boundary isolation pipeline, it suppresses surface noise and extracts true physical geometry with sub-pixel fidelity. This ledger presents verified performance metrics, compute profiles, and labor reclamation data.

## II. VERIFIED INDUSTRIAL PERFORMANCE MATRIX

PIPELINE TIER	INGEST ASSET TYPE	COMPUTE TIME	BASELINE HUMAN DRAFTING	EXTRACTION MULTIPLIER
<b>01. Maritime/Aerospace</b>	Drone/Satellite + Ortho	1,051 ms	14.5 hours	49,000×
<b>02. Historic Casework</b>	72-DPI Auction Preview	1,906 ms	12.0 hours	22,000×
<b>03. Lattice Textiles</b>	Low-Contrast Woven Cane	840 ms	8.5 hours	36,000×
<b>04. Mass Conservation</b>	Multi-Ply Corrugated	1,120 ms	18.0 hours	57,000×
<b>05. Refractive Metal</b>	Variable Lighting Macro	744 ms	6.0 hours	29,000×

*Note: Multipliers calculated against median skilled drafter output at 100% utilization.*

### III. INTEGRATION COMPATIBILITY LIST (ICL)

The Pane 4 Kernel provides seamless interoperability with the following industrial environments. Data is exported as high-contrast raster intermediates for vectorization or direct coordinate mapping.

#### A. CAD/CAM Environments

- **Autodesk Fusion 360 / AutoCAD:** Direct DXF/DWG path import for auto-snapping and lofting.
- **Rhino3D / Maxsurf:** Native spline path import for complex hydrographic hull lofting.
- **SolidWorks:** Feature-based boundary recognition via integrated API hooks.

#### B. CNC & Additive Infrastructure

- **G-Code Generation:** Compatible with standard 3-axis to 5-axis controller logic (Fanuc/Haas).
- **Laser/Punch/Waterjet:** High-contrast edge-snapping for automated toolpath lead-in/lead-out generation.

#### C. Visualization & Rendering

- **Unreal Engine / V-Ray:** Immediate PBR Normal/Displacement map generation for real-time spatial computing.

### IV. AMORTIZATION & OPERATIONAL IMPACT

- **Labor Reclamation:** Median drafting time reduced from 11.8 hours to < 2 seconds per asset.
- **Error Elimination:** Zero broken/intersecting paths or redundant nodes; eliminates toolpath deflection and junction burning.
- **Lead Time Compression:** Transitions production workflows from weeks to same-shift tooling.
- **ROI Projection:** High six-figure to low seven-figure labor and schedule savings per 10-station deployment annually.

### V. DEPLOYMENT & SECURITY MODEL

The Pane 4 Kernel deploys exclusively as an on-premises **Deterministic Triage Hot Folder Node**.

- **Architecture:** Fully localized execution. No cloud, no neural weight updates, no external telemetry.
- **Calibration:** Site-specific optimization to match licensee CNC tolerances and image capture standards.
- **Security:** Pure-IP posture. No open evaluation licenses. Live validation sessions restricted to approved **Vanguard Cohort** partners.

## **PROVISION1 LABORATORY**

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