MachiningCloud
Own the Process

MachiningCloud

Aerospace & Defense
White Paper

Audit-Ready Tool Data, Conservative Margins Reclaimed, and Tribal Knowledge That Outlives Retirement.

TOOL MANAGEMENT | JOB PLANNING | DATA INTEGRATION

www.machiningcloud.com

WHAT'S AT STAKE

Precision Isn't the Goal in Aerospace and Defense. It's the Baseline.

Aerospace and defense shops already hit tolerances most industries consider impossible. The cutting isn't the problem. The problem is everything around it: documentation, traceability, conservative parameters, and the slow erosion of capability as senior machinists retire. These aren't efficiency problems. In A&D, they're compliance, margin, and capability problems.

01 **Audit traceability gaps**

02 **Revision control failures**

03 **Conservative cutting**

04 **Retiring tribal knowledge**

THE FOUR PAINS

Where A&D Shops Quietly Lose Time, Margin, and Capability.

01 Audit traceability gaps

AS9100 and NADCAP demand a documented chain from design intent to finished part. When tool data lives in spreadsheets, CAM libraries, and handwritten travelers, gaps surface six months later — in front of an auditor.

02 Revision control failures

A titanium structural part spends three weeks in-process. When the engineering revision changes mid-run — and it will — wrong tool data propagates through every system populated by manual re-entry. One missed update scraps a five-figure workpiece.

03 Conservative feeds and speeds

When cutting data isn't trusted, programmers default to safe. On Inconel 718 or Ti-6Al-4V, safe means 20–40% below what the manufacturer certifies the tool can sustain. The spindle is turning. The margin is bleeding — every cycle, every part.

04 Tribal knowledge walking out

The machinist who knows why you step down 0.015 on that pocket is three years from retirement. His replacement won't learn it from a spreadsheet. If the knowledge isn't captured in an accessible system, capability leaves with him.

THE PLATFORM

Three Integrated Pillars. One Documented Workflow.

MachiningCloud is organized around three pillars. Every aerospace and defense supplier touches all three — from first catalog search through finished audited part.

01

TOOL MANAGEMENT

Find, organize, and procure the right tools.

Every tool, every revision, every audit — in one system instead of seven spreadsheets. ISO 13399, GTC, STEP, and DIN 4000 compliant. When an auditor asks which tool cut which revision of which part, you answer in seconds.

02

JOB & PROCESS PLANNING

Plan faster. Program accurately.

Tool Advisor combines deterministic engineering logic with AI to recommend the right tools, feeds, and speeds. 90%+ manufacturer-certified coverage means programmers stop defaulting to safe on Inconel and Ti-6Al-4V.

03

DOWNSTREAM INTEGRATION

Push clean data into every system.

Direct integrations with ESPRIT EDGE, Mastercam, hyperMILL, GibbsCAM, and Siemens NX. Tool data flows automatically into your TMS and ERP. Every eliminated re-entry is one fewer place an audit-killing transcription error can hide.

BEFORE AND AFTER

What MachiningCloud Replaces in an A&D Shop.

Today's Approach ✗	With MachiningCloud ✓
✗ Tool data scattered across spreadsheets & CAM	✓ Single source of truth, audit-ready in one system
✗ Feeds & speeds from guesswork on Inconel/Ti	✓ Manufacturer-certified data on 90%+ of catalog
✗ Setup sheets retyped by hand between systems	✓ Auto-generated, revision-controlled, every job
✗ Manual data re-entry into TMS and ERP	✓ Direct integration; zero re-entry, zero errors
✗ Tribal knowledge held by senior machinists	✓ Captured workflows accessible to whole team

TWO BUYERS, ONE PLATFORM

Tier Suppliers and Defense Primes Share the Frame. The Pressures Are Different.

AS9100, NADCAP, first-article integrity — these are shared stakes. The day-to-day pressures are not. MachiningCloud serves both audiences.

COMMERCIAL AEROSPACE SUPPLIERS

When the OEM ramps rate, your shop scales or gets replaced.

- Rate production ramps dictated by OEM demand
- Tier supplier certification audits every 12–18 months
- First-article approval cycles that can't afford re-submission
- Supply chain volatility on exotic alloys and specialty tooling

DEFENSE CONTRACTORS

Small lots. High mix. Long-life platforms. ITAR on every file.

- ITAR and export control on every design file
- Small-lot, high-mix — no economies of scale to absorb errors
- Legacy platform sustainment for airframes built decades ago
- Data sovereignty and security requirements from primes above

THE NUMBERS

Scale, Coverage, and Measurable Returns.

~30%	~30%	<30	1.5M+	75+
Planning & programming time saved	Machine setup time reduced	Days to typical payback	Certified tool models	Manufacturer partners

Trusted by precision aerospace and defense suppliers across North America and Europe.

Figures based on customer-reported outcomes. Catalog and partner scale per current platform data.

THE RETURN

$79,600/year on a $3,600 Investment.

The math on a 20-machine shop running 200 jobs/year, $45/hr programmer, $100/hr machine.

OFFICE

$21,600

Catalog search & programming efficiency

PILLARS 1 + 2

SHOP FLOOR

$48,000

Feeds & speeds unlock capacity

PILLAR 2

PROCUREMENT

$10,000

Smarter sourcing across 75+ catalogs

PILLAR 1

TOTAL: $79,600/year

Sub-30-day payback. 22× annual return.

WHY THIS IS A FLOOR, NOT A CEILING

For A&D Suppliers, $79,600 Understates the Real Return.

The 20-machine model uses generic CNC economics. In aerospace and defense, three factors compound the return — and one avoided event can dwarf the baseline math entirely.

01

Higher part values

A 30% cycle-time gain on an Inconel or Ti-6Al-4V workpiece is worth measurably more than the same gain on mild steel. Same hours, more revenue.

02

Higher machine rates

5-axis A&D machine rates often run $120–$180/hr versus the $100/hr baseline. Every shop-floor hour reclaimed is worth more.

03

Higher scrap cost

Scrapping a $40K titanium billet on bad data isn't waste. It's a margin event. Better tool data prevents the kind of mistakes that hurt most.

AND THE ONE AVOIDED EVENT

A single failed AS9100 audit. A single NCR on a prime program. A single batch rejection on a defense order. Any one of these costs more than the entire annual MachiningCloud investment. The $79,600 isn't the upside — it's what you earn while preventing the disaster.

HOW TO START

A 90-Day Implementation Path for A&D Shops.

Most A&D suppliers see meaningful results inside 30 days. Full integration with CAM, TMS, and ERP typically completes in 90.

1 – 2 – 3 – 4

WEEKS 1–2

Tool Library Migration

Import existing tool catalogs and shop-specific assemblies. Audit reveals gaps for the first time.

WEEKS 3–4

Programmer Onboarding

Tool Advisor in production. First validated feeds & speeds replace conservative defaults on Inconel / Ti work.

WEEKS 5–8

CAM Integration

Direct integration with your CAM system. Setup sheets auto-generate. Manual re-entry begins to disappear.

WEEKS 9–12

TMS / ERP Integration

Procurement integrated. Tool data flows downstream. AS9100 documentation chain closes.

NEXT STEP

See MachiningCloud in Your Shop.

A 20-minute walkthrough against your actual workflow. Bring a part you're quoting — an Inconel housing, a Ti-6Al-4V bracket, an AS9100-controlled assembly. We'll plan it with you.

Book a Walkthrough →

www.machiningcloud.com