



FOR AEROSPACE & DEFENSE OEMS

The Industrial Coating Toolkit

SELECTION · SOURCING · SUPPLIER EVALUATION

ISO 9001:2015

AS9100D

ITAR REGISTERED

07/02 FFL

ADVANCED CERTIFIED CERAKOTE® APPLICATOR

Fewer than 5% of coating applicators hold all four aerospace & defense certifications.

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This toolkit was built for the engineers, buyers, and procurement teams we work with every day. It's not a sales brochure — it's a set of practical tools to help you select the right coating, write a better RFQ, and evaluate coating vendors with confidence. Use it however it's useful to you.

We're an AS9100D, ISO 9001:2015, ITAR-registered, Advanced Certified Cerakote® Applicator in Johnstown, Colorado. Fewer than 5% of coating applicators in the U.S. hold all four credentials. The thinking in this toolkit reflects what we've learned coating tens of thousands of aerospace parts across those certifications.

— Jack Seitz, Managing Director

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Important: This chart identifies coating families, not specific products. Final coating selection depends on part geometry, operating environment, batch size, and customer specifications. Use this as a starting point for conversations with your engineering team and coating vendor — not as a substitute for application-specific testing.

SECTION 01

Coating Selection Reference Chart

Find your **substrate material** below. Cross-reference with your **primary performance requirement** across the top. The intersecting cell shows recommended coating types and the applicable specification or test standard.

Metallic Substrates

Aluminum & Aluminum Alloys (2024, 6061, 7075, etc.)

PERFORMANCE REQUIREMENT	RECOMMENDED COATING(S)	APPLICABLE SPEC / TEST STANDARD	KEY CONSIDERATIONS
Corrosion protection	Chromate conversion (Type I or II), Anodize (Type II or III), Alodine, Cerakote® E-Series	MIL-DTL-5541, MIL-PRF-8625	Type I chromate being phased out (hex chrome); Type II/III anodize for longer-term corrosion resistance. RoHS compliance may restrict chromate options.
Wear / abrasion resistance	Hard anodize (Type III), Cerakote® E/H Series, Nickel boron (NiB)	MIL-PRF-8625 Type III, ASTM D4060 (Taber)	Hard anodize adds 0.001-0.002" per side — account for tolerances. Cerakote® H-Series rated to 500°F with excellent abrasion resistance on aluminum.
Temperature resistance (>500°F)	Cerakote® C-Series, Cerakote® E/H Series, Ceramic thermal barrier	ASTM E1461 (thermal diffusivity test), customer-specific	Aluminum substrates degrade above ~400-500°F depending on alloy and temper — coating protects the substrate but doesn't change its thermal limit. Validate with end-use testing.
Chemical / solvent resistance	Cerakote® E/H Series, Fluoropolymer (PTFE/FEP), Powder coat (epoxy)	ASTM D1308, ASTM B117	Fluoropolymer excels for chemical resistance but has lower hardness. Cerakote® E/H Series balances both. Epoxy powder coat for cost-effective industrial chemical resistance.
Electrical insulation	Anodize (Type II/III), Cerakote® H-900 Electrostatic barrier	ASTM D149 (dielectric strength)	Hard anodize provides excellent dielectric properties. Coating thickness directly affects insulation value — specify minimum thickness.
Low friction / lubricity	Cerakote® OFL Series, Dry film lubricant (MoS2)	MIL-PRF-46010 (MoS2), SAE AS1701	OFL Series is DFL-free and PFAS-free. MoS2 performs best in vacuum/space applications. Consider operating temperature range.
Cosmetic / decorative	Anodize (Type II) with dye, Cerakote® H-Series, Powder coat	MIL-PRF-8625, customer color spec	Anodize dye limited to certain colors and fades in UV. Cerakote® offers full Pantone matching. Powder coat most cost-effective for non-critical cosmetic.

Steel & Stainless Steel (4130, 4340, 17-4PH, 300 series, etc.)

PERFORMANCE REQUIREMENT	RECOMMENDED COATING(S)	APPLICABLE SPEC / TEST STANDARD	KEY CONSIDERATIONS
Corrosion protection	Zinc phosphate + paint, Cerakote® E/H Series, Cadmium plate, Zinc-nickel plate	MIL-DTL-16232 (phosphate), SAE-AMS-QQ-P-416 (cadmium), ASTM B841 (Zn-Ni)	Cadmium restricted in many applications (toxic) — zinc-nickel is the modern replacement for aerospace. Cerakote® provides corrosion + wear in one step.
Wear / abrasion resistance	Cerakote® E Series, DLC (diamond-like carbon), Hard chrome, Nickel boron	ASTM C1624 (scratch), AMS 2460 (hard chrome)	DLC is the premium option — extremely hard (1500-3000 HV), low friction, thin film. Hard chrome being phased out due to hex chrome regulations. NiB is the drop-in replacement.
Temperature resistance (>1000°F)	Cerakote® C-Series, Ceramic thermal barrier, Plasma-sprayed alumina	ASTM E1461 (thermal diffusivity test), AMS 2437 (plasma spray)	C-Series Cerakote® rated up to 1200°F (standard) or 1800°F (Glacier line). Plasma spray for extreme environments but requires specialized equipment and thicker build-up.
Chemical / solvent resistance	Fluoropolymer (PTFE/FEP), Cerakote® E Series, Epoxy powder coat	ASTM D1308, ASTM B117	Same hierarchy as aluminum. Stainless steel substrates add inherent corrosion resistance — coating primarily for chemical splash/immersion protection.
H2 embrittlement prevention	Cadmium plate, Zinc-nickel plate (with bake cycle), IVD aluminum	AMS 2427 (IVD Al), ASTM F519 (H2 embrittlement test)	Critical for high-strength steel (>180 ksi). Begin bake within 4 hours of plating per spec. IVD aluminum is the emerging standard for aerospace H2 embrittlement protection.
Low friction / lubricity	DLC, Cerakote® DFL Series, MoS2 dry film	MIL-PRF-46010, ASTM G99 (pin-on-disk)	DLC provides lowest friction coefficient (0.05-0.20 depending on conditions) with extreme hardness. MoS2 for high-load, low-speed applications.

Titanium & Titanium Alloys (Ti-6Al-4V, Grade 2, Grade 5, etc.)

PERFORMANCE REQUIREMENT	RECOMMENDED COATING(S)	APPLICABLE SPEC / TEST STANDARD	KEY CONSIDERATIONS
Wear / galling resistance	DLC, Cerakote® E Series, Cerakote® DFL Series, Anodize (titanium-specific), Nitriding	AMS 2488 (Ti anodize), ASTM G98 (galling test)	Titanium is highly susceptible to galling — coating is often required for any mating/sliding surfaces. DLC or nitriding preferred for critical applications.
Corrosion protection (elevated temp)	Ceramic thermal barrier, Cerakote® E Series, Diffusion aluminide	Per OEM spec, customer-specific	Titanium has excellent native corrosion resistance — coatings typically for high-temp oxidation protection above 600°F.
Biocompatibility (medical)	Anodize (Type II), PVD titanium nitride (TiN), Hydroxyapatite	ASTM F86 (implant surface prep), ISO 10993 (biocompatibility)	ISO 10993 biocompatibility testing required. ASTM F86 for implant surface preparation. Anodize most common for implantable devices. TiN for wear surfaces in surgical instruments.

Non-Metallic & Specialty Substrates

Plastics & Polymers

PERFORMANCE REQUIREMENT	RECOMMENDED COATING(S)	APPLICABLE SPEC / TEST STANDARD	KEY CONSIDERATIONS
EMI/RFI shielding	Conductive paint (copper/silver filled), Vacuum metallization, Cerakote® with conductive additive	MIL-STD-461 (EMI), IEEE 299	Substrate must tolerate process temperature. Most plastic coatings cure at <250°F. Adhesion promotion (plasma or chemical etch) almost always required.
Wear / scratch resistance	Cerakote® E/H Series, PVD, UV-cure hard coat	ASTM D4060, ASTM D3363 (pencil hardness)	Thin coatings preferred to avoid stress cracking on flexible substrates. Surface prep is critical — plasma treatment recommended for adhesion.
Cosmetic / tactical	Cerakote® H-Series, Hydrographic, Spray chrome	Customer color spec	Cerakote® offers the broadest color range with added protection. Hydrographic for complex patterns. Both require proper primer for plastic adhesion.

Composites (Carbon Fiber, Fiberglass, Kevlar)

PERFORMANCE REQUIREMENT	RECOMMENDED COATING(S)	APPLICABLE SPEC / TEST STANDARD	KEY CONSIDERATIONS
UV / environmental protection	Primer + polyurethane topcoat, Cerakote® C Series	ASTM G154 (UV aging), ASTM D3359 (adhesion)	Composites degrade under UV — coating is protective, not decorative. Cure temperature must stay below composite's glass transition temperature.
Abrasion / erosion resistance	Polyurethane rain erosion coating, Cerakote® E/H Series	ASTM G76 (erosion), SAE-AMS-C-83231	Leading edge erosion is primary concern for aero composites. Coating flexibility must match composite flex without cracking.

Quick Reference: Coating Families at a Glance

COATING FAMILY	THICKNESS RANGE	MAX SERVICE TEMP	HARDNESS (TYPICAL)	BEST FOR
Cerakote® E-Series	~0.001" (1 mil)	Up to 500°F	9H pencil	Next-gen all-around protection: corrosion + wear + chemical + cosmetic
Cerakote® H-Series	~0.001" (1 mil)	Up to 500°F	9H pencil	All-around protection: corrosion + wear + chemical + cosmetic
Cerakote® C-Series	0.001-0.002"	Up to 1200°F (Glacier: 1800°F)	Up to 7H	High-temperature applications, exhaust, firearm components
Cerakote® OFL Series	~0.001"	Up to 500°F	—	Low friction / lubricity, DFL-free, PFAS-free
Cerakote® DFL Series	~0.001"	Up to 500°F	—	Dry film lubricant, low friction
Hard Anodize (Type III)	0.001-0.002"	400°F (substrate)	60-70 Rc equiv.	Wear resistance on aluminum, electrical insulation
DLC	0.00005-0.0002"	Up to 600°F (varies by type)	1500-3000 HV	Ultra-low friction, extreme hardness, medical/aerospace
Nickel Boron (NiB)	0.0003-0.002"	1200°F	70 Rc (heat treated)	Hard chrome replacement, uniform coverage on complex geometry
Zinc-Nickel Plate	0.0003-0.001"	250-300°F (passivated)	300-450 HV	Cadmium replacement, H2 embrittlement-safe for high-strength steel
Powder Coat (various)	0.002-0.030"	200-400°F	F-4H pencil	Cost-effective corrosion + cosmetic for non-critical applications
PTFE / Fluoropolymer	0.001-0.003"	400-500°F	Low	Chemical resistance, non-stick, low friction
MoS2 Dry Film	0.0002-0.0005"	750°F (in air)	Low	Lubricity in vacuum, space, or high-load/low-speed applications
PVD (TiN, CrN, etc.)	0.00005-0.0003"	1000°F+	1500-3500 HV	Tooling, medical instruments, decorative-functional

Notes on Using This Chart

"Which coating should I choose?" — If your application maps to multiple coating options, prioritize by: (1) customer/program specification requirements (these override everything), (2) primary performance driver, (3) substrate compatibility, (4) operating environment, (5) cost and lead time.

Dual-coating systems — Some applications require a primer + topcoat or a conversion coating + finish coat. This is common in aerospace (phosphate + primer + topcoat) and defense (phosphate + Cerakote®). If your spec calls for a multi-step process, your RFQ should list the complete system — not just the topcoat.

When in doubt, ask. A 10-minute conversation before you finalize the spec beats a failed lot at incoming inspection. Call 970-541-7331 or submit a question at coloradokote.com.

SECTION 02

The RFQ Checklist for Industrial Coatings

This checklist covers every field a coating vendor needs to give you an accurate, fast quote. Missing even one item adds days of back-and-forth to the quoting process — and can lead to misquoted jobs, coating failures, or delivery delays.

Print this page. Pin it next to your monitor. Use it every time.

PART IDENTIFICATION

- Part number and revision level
- Part description (what it is, what it does — this helps the coater understand the application)
- Drawing, STEP file, or CAD file attached (with dimensions and tolerances called out)
- Material / substrate (specific alloy, not just "aluminum" or "steel" — 6061-T6 and 7075-T6 coat very differently)
- Current condition of parts (raw, machined, previously coated, heat-treated, etc.)

COATING SPECIFICATION

- Coating type or specification (MIL-spec, AMS, customer spec, or describe the performance requirement and let the coater recommend)
- Coating thickness requirements (min/max, per side or total — specify which)
- Color (Pantone, RAL, Federal Standard, or "match to sample")
- Finish / texture (matte, semi-gloss, gloss, textured — specify if critical)

SURFACE PREP & MASKING

- Surface prep requirements (media blast, chemical etch, conversion coating, or "per vendor process")
- Masking requirements — be specific:
 - Threads (which ones — call out by feature or drawing reference)
 - Bores / holes (diameter and depth — do not coat? coat partially?)
 - Mating surfaces (identify by drawing reference)
 - Electrical contact points
 - Any "do not coat" areas (mark on STEP file — best — or drawing if possible)
- Tolerance on masked areas (± 0.001 "? ± 0.005 "? This matters — tighter masking = higher cost)

TESTING & INSPECTION

- Adhesion testing required? (ASTM D3359 tape test, ASTM C1624 scratch, pull test — specify method and acceptance criteria)
- Corrosion testing required? (salt spray hours per ASTM B117, humidity, cyclic corrosion — specify hours and acceptance)
- Thickness measurement required? (specify method: magnetic, eddy current, cross-section — and number of measurement points)
- Hardness testing required? (Vickers, Rockwell, pencil — specify scale and minimum value)
- Visual inspection criteria (accept/reject standards — reference workmanship standard or provide limit samples)
- Certificate of Conformance (C of C) required?
- First Article Inspection required?
- Material certifications / test reports required?

COMPLIANCE & CERTIFICATIONS

- Quality system requirements (ISO 9001, AS9100D, IATF 16949 — specify which)
- ITAR requirements (is this a controlled item? does the coater need ITAR registration?)
- NADCAP required? (for which processes — coating, chemical processing, NDT?)

- Customer-specific quality requirements** (Boeing D6-82479, Lockheed Martin SQAR, Raytheon SQR, Safran WPS — name the document)
- RoHS / REACH compliance required?**
- Country of origin restrictions?** (DFARS, Buy American, Berry Amendment)

QUANTITY & LOGISTICS

- Quantity — this order** (exact piece count)
- Annual estimated volume** (helps the coater plan capacity and may affect pricing)
- Lot size for future orders** (will you send 50 at a time or 5,000?)
- Delivery timeline required** (specific date or "standard lead time acceptable")
- Shipping requirements** (packaging, labeling, hazmat considerations)
- Delivery location** (coater's lead time may not include transit)

THE QUESTION MOST BUYERS FORGET TO ASK

- "What do you need from me that I haven't provided?"** — Include this line in your RFQ. It gives the coater permission to flag gaps before quoting, which means fewer surprises after the PO is issued.

Quick-Start Version

If you don't have time for the full checklist, never send a coating RFQ without at minimum these 6 fields:

- 1. Substrate material (specific alloy) • 2. Coating specification or performance requirement • 3. Masking locations (or "no masking required") • 4. Testing requirements (or "C of C only") • 5. Quality system / certification requirements • 6. Quantity and delivery date

Everything else improves the quote. These six make it possible.

Ready to submit? We built our RFQ form around this exact checklist.
Every field maps to what we actually need to quote you right the first time.

[Submit an RFQ at coloradokote.com/rfq](https://coloradokote.com/rfq)

SECTION 03

The Coater Evaluation Scorecard

Score each vendor 1-5 on every criterion. Total the scores. Pay attention to the **weighted categories** — certifications and quality systems matter more than turnaround time promises when your parts are going into a Boeing or Lockheed assembly.

Category 1: Certifications & Compliance

Weight: 3x

This is the category that kills deals after they've started. A coater without the right certs can't ship to your customer — period. Verify before you quote.

#	CRITERION	VENDOR A	VENDOR B	VENDOR C
1	ISO 9001:2015 certified — not "compliant" — certified, with a current certificate from an accredited registrar	__ / 5	__ / 5	__ / 5
2	AS9100D certified — required for aerospace. Ask to see the certificate and verify the scope covers the process you need	__ / 5	__ / 5	__ / 5
3	ITAR registered — required for defense. Ask for the registration number, not just "yes we're ITAR"	__ / 5	__ / 5	__ / 5
4	NADCAP accredited for relevant processes — coating, chemical processing. Check the scope on eAuditNet	__ / 5	__ / 5	__ / 5
5	Customer-specific approvals — are they on your end customer's approved vendor list (Boeing QPL, Lockheed SQAR, etc.)?	__ / 5	__ / 5	__ / 5
6	RoHS / REACH / DFARS compliance documented — can they provide compliance certificates, not just verbal confirmation?	__ / 5	__ / 5	__ / 5

Category subtotal: __ / 30 × 3 = __

Category 2: Technical Capability

Weight: 2x

Can they actually do what you need? Not "we can figure it out" — but demonstrated capability with process controls in place.

#	CRITERION	VENDOR A	VENDOR B	VENDOR C
7	Process range — do they offer the specific coating type/process your parts require? In-house capability, not outsourced.	__ / 5	__ / 5	__ / 5
8	In-house testing capability — adhesion, thickness, hardness, salt spray, visual inspection on-site? Or outsourced?	__ / 5	__ / 5	__ / 5
9	Engineering support — process engineers who can help you spec the right coating, troubleshoot failures, and optimize?	__ / 5	__ / 5	__ / 5

#	CRITERION	VENDOR A	VENDOR B	VENDOR C
10	Process documentation — written procedures, work instructions, and process control plans? Ask to see them.	__ / 5	__ / 5	__ / 5
11	Material traceability — can they trace coating materials back to the manufacturer lot? Required for most aero/defense programs.	__ / 5	__ / 5	__ / 5

Category subtotal: __ / 25 x 2 = __

Category 3: Capacity & Reliability Weight: 1.5x

The best coating in the world doesn't help if the parts are late. Evaluate their ability to deliver consistently — not just once.

#	CRITERION	VENDOR A	VENDOR B	VENDOR C
12	Production capacity — can they handle your current volume AND scale if your program grows? Ask about utilization and shift structure.	__ / 5	__ / 5	__ / 5
13	On-time delivery track record — ask for their OTD metric. If they don't track it, that's your answer. Benchmark: >95% good, >98% excellent.	__ / 5	__ / 5	__ / 5
14	Standard lead time — quoted lead time vs. actual? Ask for both. Get it in writing.	__ / 5	__ / 5	__ / 5
15	Expedite capability — when (not if) you need parts rushed, can they do it? What's the upcharge? Formal process or begging?	__ / 5	__ / 5	__ / 5
16	Disaster recovery / redundancy — if their oven goes down, what's the plan? Backup equipment or a qualified secondary source?	__ / 5	__ / 5	__ / 5

Category subtotal: __ / 25 x 1.5 = __

Category 4: Quality Track Record Weight: 2x

Past performance is the best predictor of future performance. Ask hard questions. Good vendors will answer them confidently.

#	CRITERION	VENDOR A	VENDOR B	VENDOR C
17	Reject / rework rate — ask for actual data, not "very low." Benchmark: <1% is good for precision coating.	__ / 5	__ / 5	__ / 5
18	Corrective action process — formal CAPA system? Can they issue 8Ds? Do they track root cause?	__ / 5	__ / 5	__ / 5
19	Customer references — will they give you 2-3 customers in your industry you can call? If they won't, ask yourself why.	__ / 5	__ / 5	__ / 5
20	Audit readiness — can you audit their facility? The answer should be "yes, when would you like to come?"	__ / 5	__ / 5	__ / 5

Category subtotal: ___ / 20 × 2 = ___

Category 5: Communication & Partnership Weight: 1x

The unsexy category that determines whether you dread every interaction or trust the relationship.

#	CRITERION	VENDOR A	VENDOR B	VENDOR C
21	Quote responsiveness — how fast did they return your RFQ? Did they ask smart clarifying questions or just quote a number?	___/5	___/5	___/5
22	Technical communication — do you get a clear answer from someone who understands the process? Or routed through a sales rep?	___/5	___/5	___/5
23	Proactive problem notification — if something goes wrong in production, do they call you before it becomes your problem?	___/5	___/5	___/5
24	Continuous improvement — investing in equipment, training, and process improvement? Or the same setup from 10 years ago?	___/5	___/5	___/5

Category subtotal: ___ / 20 × 1 = ___

Scoring Summary

CATEGORY	MAX WEIGHTED SCORE	VENDOR A	VENDOR B	VENDOR C
1. Certifications & Compliance (x3)	90	—	—	—
2. Technical Capability (x2)	50	—	—	—
3. Capacity & Reliability (x1.5)	37.5	—	—	—
4. Quality Track Record (x2)	40	—	—	—
5. Communication & Partnership (x1)	20	—	—	—
TOTAL	237.5	—	—	—

How to Interpret the Scores

- 200+** This is a qualified, capable coating partner. Move to trial order.
- 160–199** Solid vendor with some gaps. Identify the low-scoring areas — are they dealbreakers or development opportunities? Some criteria (like NADCAP) may not apply to your program.
- 120–159** Significant gaps. Proceed with caution. If you're considering this vendor, get specific commitments (in writing) on the low-scoring areas before issuing a PO.
- Below 120** Look elsewhere. The risk of quality escapes, delivery failures, or compliance issues isn't worth the cost savings.

The one question that isn't on the scorecard:
"If my parts fail at my customer's incoming inspection, which of these vendors do I trust to answer the phone, own the problem, and fix it — without me having to manage every step?"
 That's the vendor you want.

Ready to Evaluate Us?

We built this scorecard knowing we'd be measured by it. Here's where ColoradoKote stands:

50,000+

AEROSPACE PARTS
COATED

99.2%

FIRST-PASS QUALITY RATE

3,000+ hrs

SALT SPRAY (ASTM B117)

<5%

OF U.S. APPLICATORS
HOLD ALL FOUR CERTS

AS9100D — Certified. Scope covers all coating processes.

ISO 9001:2015 — Certified. Current certificate available on request.

ITAR Registered — We process controlled defense articles daily.

Advanced Certified Cerakote® Applicator — Full Cerakote® portfolio: E-Series, H-Series, C-Series, OFL, DFL. 400+ standard colors.

In-house testing — Adhesion, thickness, hardness, salt spray — all on-site.

Engineering support — We help you spec it, not just coat it.

Material traceability — Full lot traceability on all coating materials.

Lead times — 14 days standard, 7 days expedite, 3 days rush.

Request a quote: coloradokote.com/rfq

Call Jack directly: 970-541-7331



"Your Finishing Partner"

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