Specifying Scratch-Off Mechanics

An **Engineered Buyer's** Guide to Coating Layers, Code Security, and Label vs. Overlay Formats

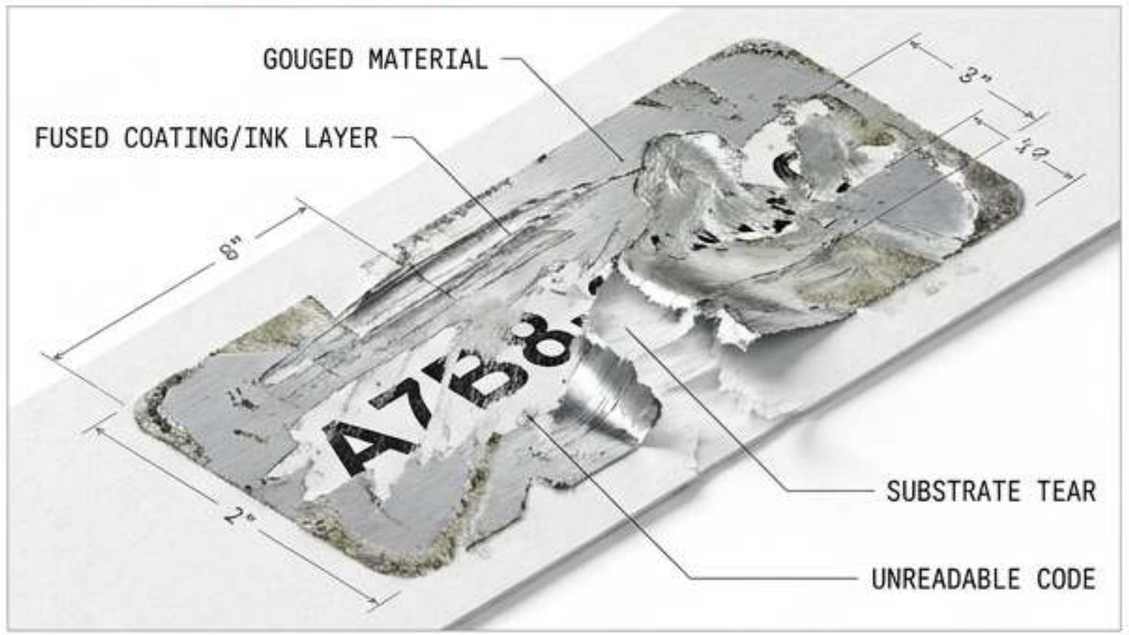


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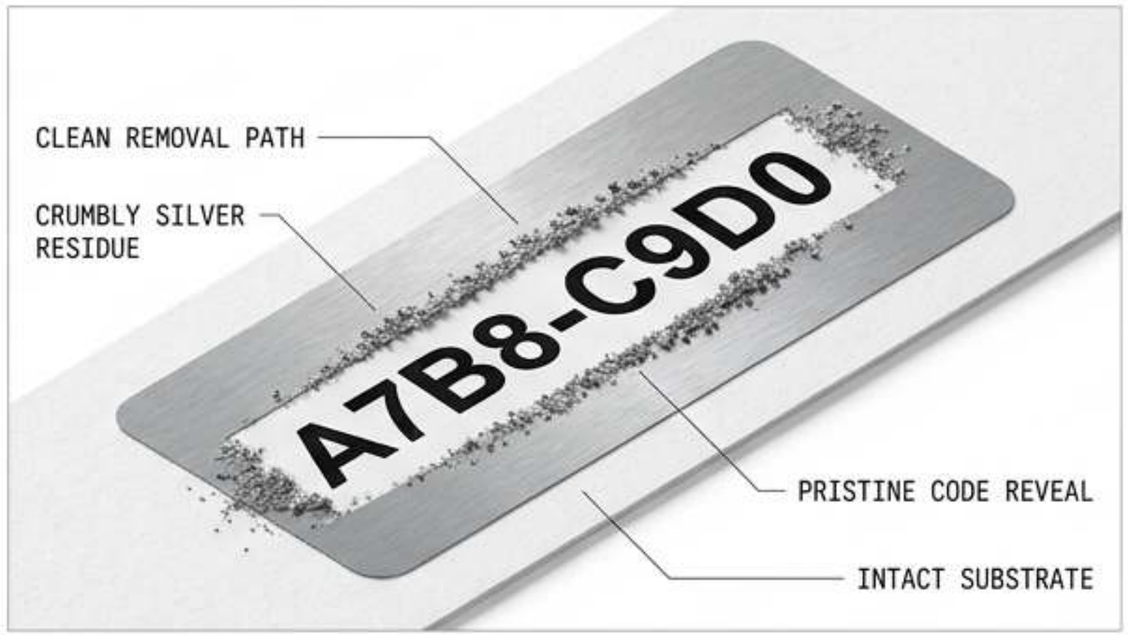
The Simplest Mechanism is Often the Point of Failure

A promotion requires flawless execution. The scratch-off panel appears to be the simplest part of the job, yet it is where catastrophic failures occur. Panels can be transparent, stubbornly hard, or so cohesive they tear the underlying digits away.

FAILURE: FUSED COATING



SUCCESS: CLEAN REVEAL



DATA POINT: THE SCALE OF BATCH VARIATION

The Michigan Lottery reported that in runs of 10–12 million tickets, physical latex coatings varied significantly—some batches were overly sticky, while tickets older than six months hardened and resisted scratching.

TAKEAWAY: A successful promotion run requires a clear physical specification and diagnostic testing before bulk printing.

The Architecture of Concealment

1. **Overprint/Pattern**
   Breaks up shapes to prevent faint shadow reading.
2. **Opaque Coating**
   Silver/gold formulation that crumbles under coin pressure.
3. **Release Varnish / Clear Film**
   The crucial barrier stopping the coating from bonding to the ink.
4. **Printed Content**
   The high-contrast unique code or PIN.
5. **Blockout Base**
   Absorbs back-lighting to prevent transparency.
6. **Face Stock**
   The physical paper or film substrate.
7. **Adhesive**
   Matches the final application surface.
8. **Release Liner**
   Carrier for transit, discarded at application.



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The Physics of a Clean Reveal

A successful scratch depends entirely on three engineered bond strengths existing in the exact right order.

Physics of a Scratch



Weak Bond (Coating to Barrier)

The release varnish provides a closed, non-porous surface. The latex coating cannot soak in, allowing a coin's edge to easily lift it.

Moderate Bond (Coating to Itself)

Formulated to break into crumbs under shear force. Too cohesive, and it smears like glue; too weak, and it rubs off in a pocket.

Opaque Coating

Release Varnish

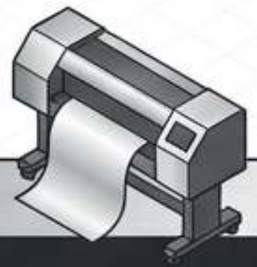
Printed Content

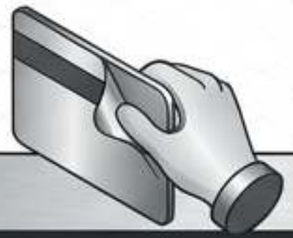
Face Stock

Strong Bond (Barrier to Ink / Ink to Stock)

The printed code must hold onto the face stock harder than anything above it, ensuring only the surface coating is removed.

Two Formats, One Core Mechanism



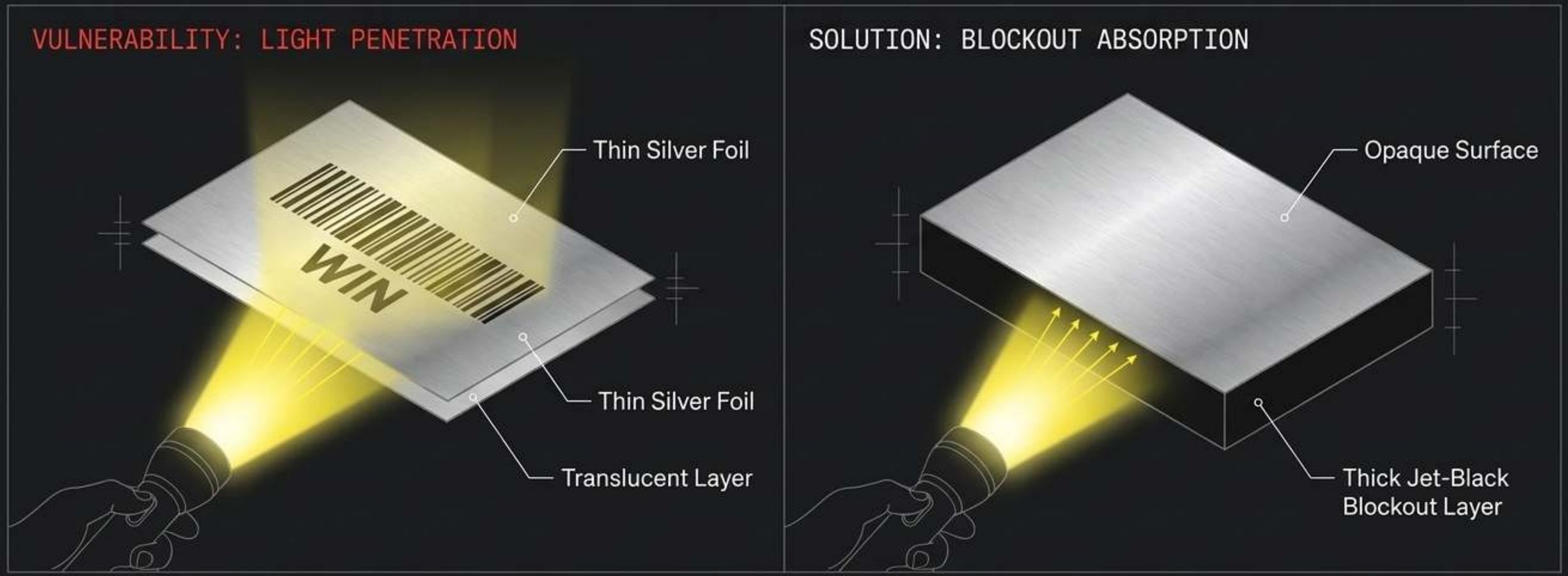


Factor	Printed Code Labels	Scratch-Off Overlays
Content Creator	Supplier prints under coating	You print/write on your card
Variable Data	Yes (Data file integration)	Only if you print unique content
Construction	Latex coating on label	Clear film with opaque coating
Security Ceiling	High (Blockout, masking, tamper)	Low (Sits on provided surface)
Typical Use	Prizes, PINs, sweepstakes	Reveals, classroom rewards, games
Zigpac Pricing Tiers (Ref)	Starts $0.45 (100+ pcs) to $0.05 (5,000+ pcs)	Starts $0.40 (100+ pcs) to $0.10 (5,000+ pcs)

Note: Final MOQ and size confirmed on quote.

The Candling Threat

A metallic surface is not proof of opacity. Standard cold foil (0.002–0.009 inches thick) frequently fails instant-ticket candling requirements. If a code holds monetary value, it is an immediate target for light-peeking.



THE SOLUTION: High-value codes require a specialized Blockout Layer beneath the code to absorb light, combined with pattern masking on the surface to break up faint visual shadows.

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The Anti-Tamper Toolkit

Advanced security requires neutralizing specific compromise vectors before they occur.

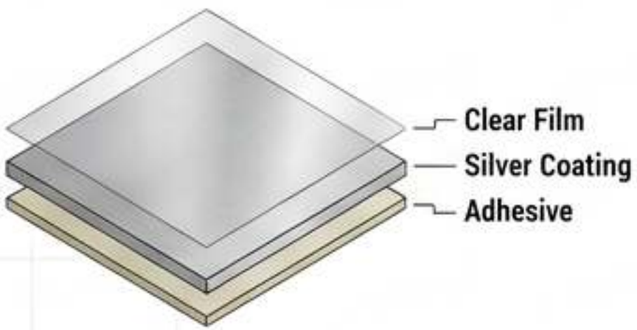
	Threat	Countermeasure
1	Candling (Backlighting)	Blockout Layer (Absorbs light).
2	Faint Code Shadows	Pattern Masking (Waves/stripes over the coating).
3	Solvent Wicking	Varnish Seal (Protects digits from chemicals).
4	Lifting & Reapplying	Destructible Film / Tamper Slits (Breaks panel upon peel attempt).

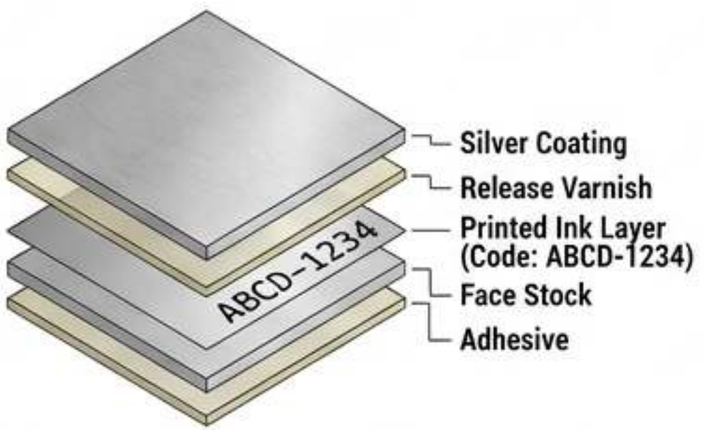


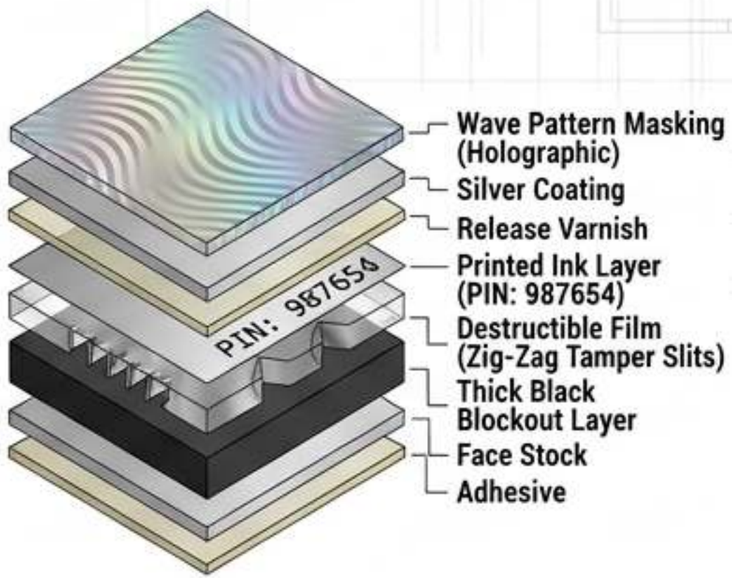
Aligning Risk with Physical Architecture

LOW RISK & VALUE

HIGH RISK & VALUE







Level 1: Fun Reveal

Low risk, spoiling the surprise.

Requires: Standard opaque panel overlay.

Level 2: Promo Codes

Medium risk, unauthorized use.

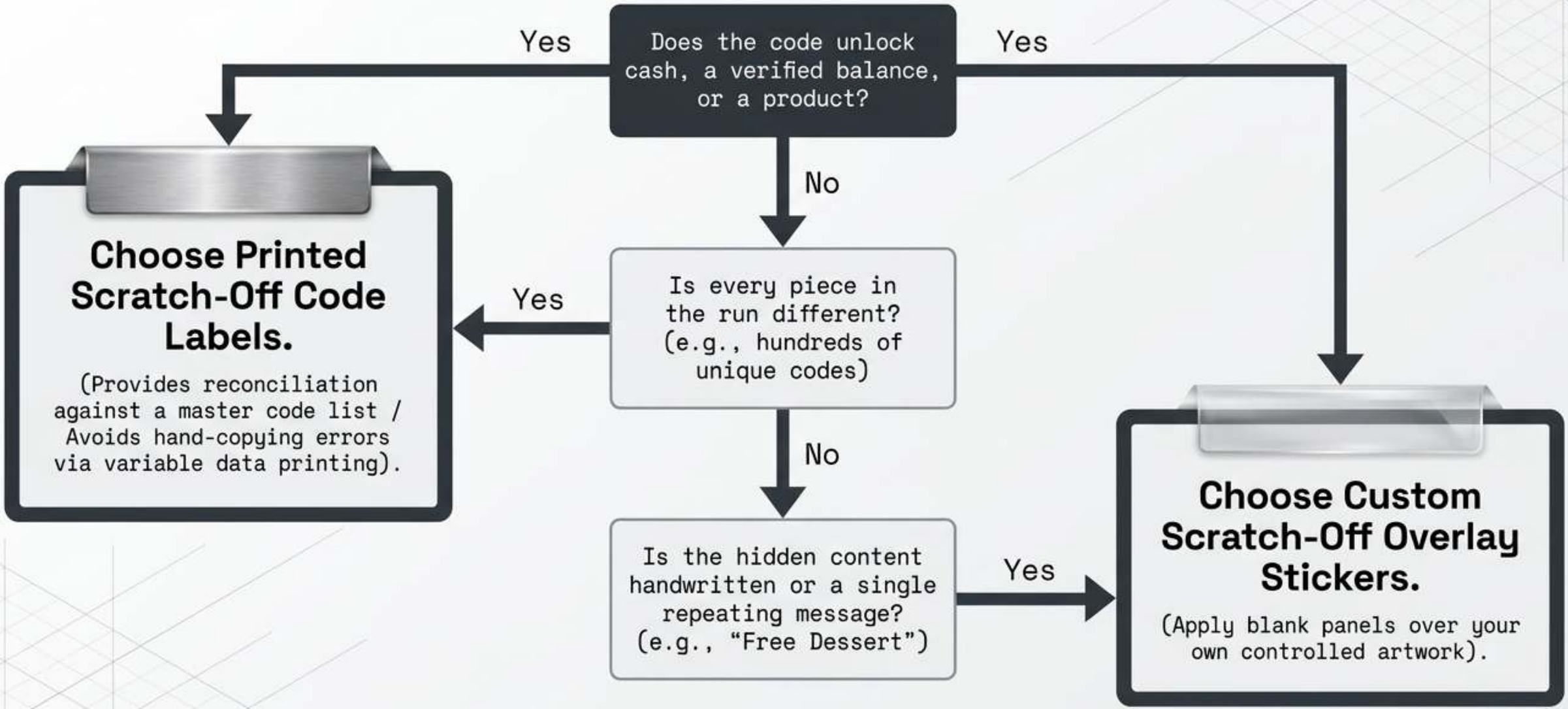
Requires: Unique data printing + standard printed code labels to prevent copying.

Level 3: Prizes & PINs

High risk, direct financial loss.

Requires: Full security architecture: Blockout layer, pattern masking, destructible film, and code-to-record reconciliation.

Choosing Your Format



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Writing a Complete Specification

- [ ] **Hidden Content:** CSV/spreadsheet for labels; photo of application method for overlays.
- [ ] **Dimensions:** Finished size, shape, and required margins around the code.
- [ ] **Aesthetics:** Panel color (silver/gold) and desired surface pattern.
- [ ] **Volume:** Quantity, including splits across different code sets.
- [ ] **Substrate:** The application surface (coated card, kraft box, plastic) to determine adhesive.
- [ ] **Risk Tier:** Code value to dictate anti-peek and tamper requirements.

Zigpac Workflow Timeline



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Critical Regulatory Boundaries

WARNING 01: THE CHILDREN'S PRODUCT LIMIT

If the promotion targets children, the scratchable surface is legally classified as a surface coating. US Consumer Product Safety Commission rules (16 CFR Part 1303) strictly ban coatings containing above 0.009% lead. Your supplier must be informed of the end-use.

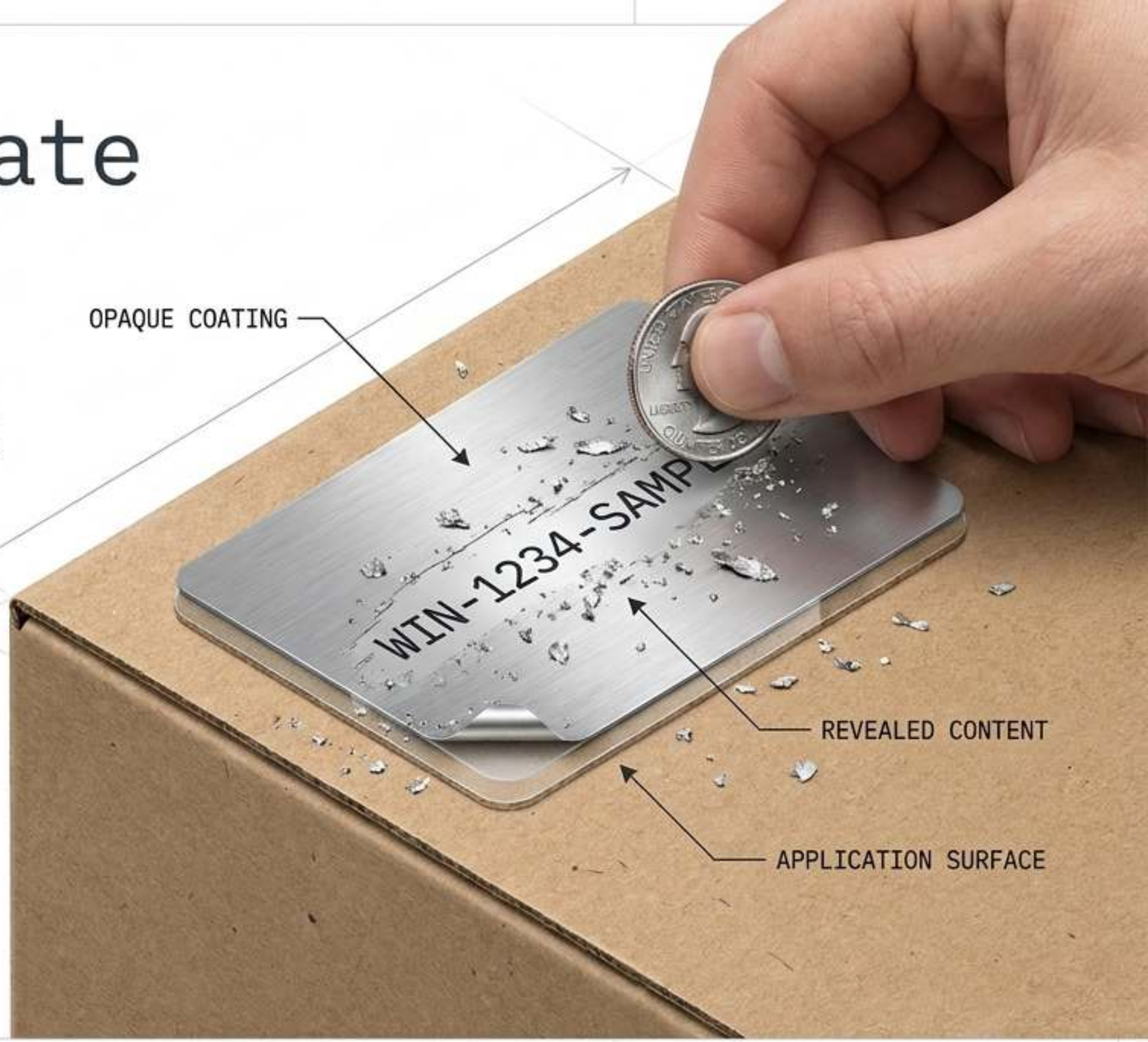
WARNING 02: THE LOTTERY DISTINCTION

Promotional labels are not instant lottery tickets. Lottery security frameworks (like WLA-SCS:2024 or BC's TGSNE2) govern state operators, not commercial promos. While you should borrow their testing methodologies, promotional panels cannot be marketed as "lottery compliant."

The Sample Mandate

A scratch-off sticker is a cooperative mechanism. The opaque coating must crumble, the barrier must repel, and the printed content must hold fast.

Because coatings age and batch chemistry varies, a physical sample scratched today is the only reliable evidence of how a bulk run will perform tomorrow.



FINAL INSTRUCTION:

At Zigpac, opacity, scratch behavior, and adhesion are proven on physical samples before full production begins.

When your sample arrives, scratch it using the exact tool your customer will use, on the exact stock you will apply it to.

SPECIFY THE MECHANICS. SECURE THE PROMOTION