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YOUR CUSTOM PRINTING & PACKAGING PARTNER FOR SMALL AND MEDIUM BUSINESSES



How to Stop Scratch Off Codes Showing Through: Blockout Layers, Pattern Masking and Light Tests

Details

Quick answer: To stop scratch off codes showing through, do not rely on silver ink alone. Print a dense blockout layer under the scratch coat, add a confusion pattern so partial glimpses read as noise, oversize the panel past the code on every side, and keep the hidden print low-contrast. Then approve the run only after backlight, raking-light and phone-flash tests on real production samples.

Why Hidden Codes Get Read Before Anyone Scratches

If you are searching for how to stop scratch off codes showing through, a sample has probably already failed in front of you. You held a reward card up to a window and saw the prize. Or you tilted a prepaid card under a shop light and could pick out the last four digits of the PIN. The panel looks solid from the front, yet light still finds a way through it or around it.

The cost depends on what sits under the panel. On a classroom reward card, a readable panel spoils the surprise. On a promotion it lets people sort winners from losers before they buy or redeem, which breaks the odds you promised. On a prepaid or gift card, the code is the money itself. The U.S. Federal Trade Commission warns that scammers tamper with cards on store displays to [steal card numbers and PINs, then wait for the buyer to load money](#)^[1]. Reporting on FTC data counted [more than 41,000 gift card theft reports and \\$217 million in losses for 2023](#)^[2].

Buyer reviews of low-cost overlay stickers show the same failure at small scale. One reviewer wrote that the stickers were "very sheer, even after we applied 2 stickers we could still see through to the image." Stacking did not help because the problem lies in how the panel is built, not in how many panels you apply. The fix is a short list of layer, design and testing decisions, set before the run ships. This guide covers those decisions. Panel formats, ordering specs and application steps are covered on our [custom scratch-off overlay stickers](#) page.

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What "Show-Through" Actually Is: Three Ways Light Leaks a Code

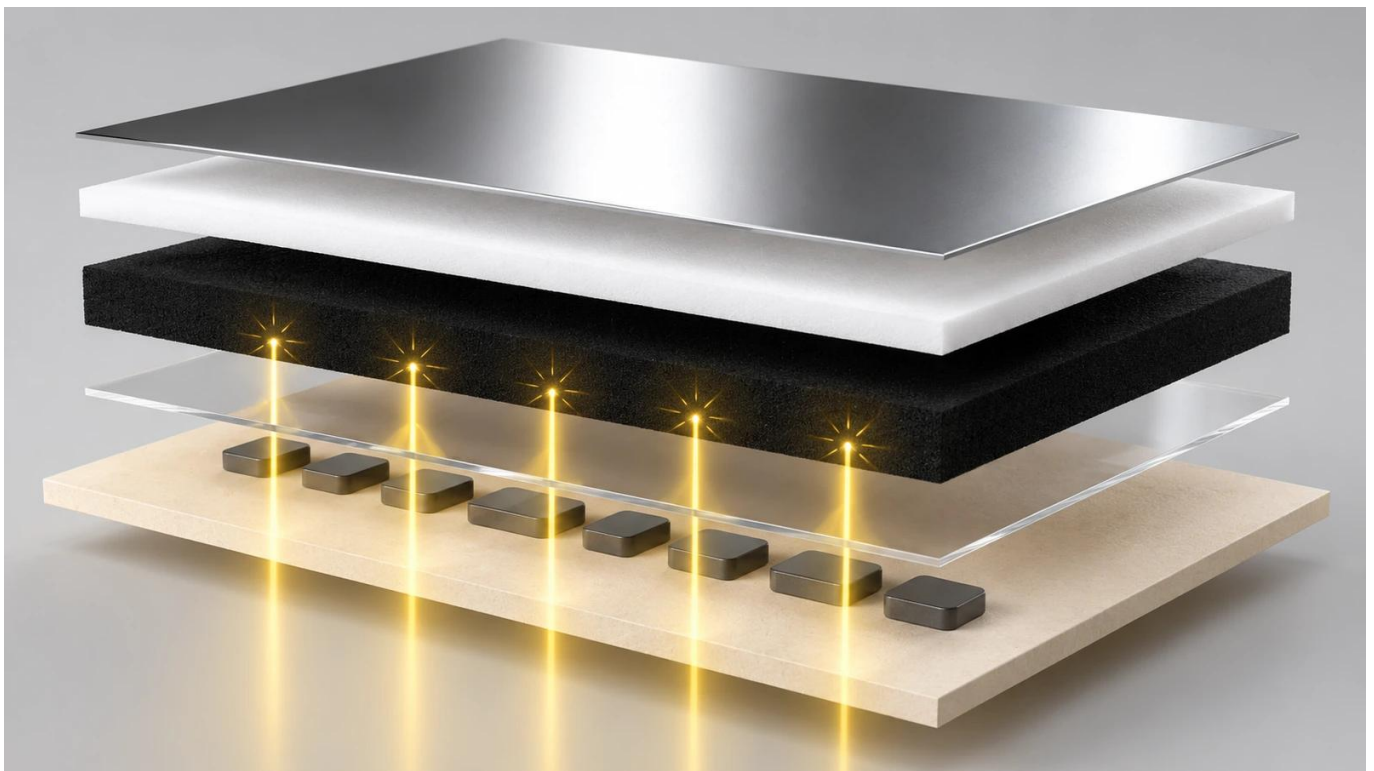
"Show-through" means any way of reading the hidden content without removing the coating. It is useful to split it into three physical paths, because each path needs a different fix.

1. Transmission (backlight). Light passes through the card stock, through the code, and out through the coating. Dark ink blocks more light than bare paper, so the code appears as a shadow on the front. Thin paper and a thin, single-pigment coat make this worse. Holding the card against a window or a phone flashlight is the classic way to read it.

2. Reflection and relief (raking light). Laser toner, UV inkjet and ballpoint pens all leave raised or pressed-in shapes. A coating follows those shapes, so a low-angle light throws tiny shadows that trace the characters. Opacity alone cannot fix this, because nobody is looking through the panel. They are reading the surface it lies on.

3. Edge and contrast leaks. A panel that is slightly off-center, or only as large as the code, leaves part of a character exposed at the edge. Very high contrast underprint, such as a black QR code on bright white stock, is the easiest content to detect through any of the three paths.

Lottery printers, who have the most at stake, solve this with layers rather than a single thick coat. As [Lottery USA explains](#)^[3], an instant ticket uses a heavy black layer to absorb light coming through, a white layer with pigments such as titanium dioxide to scatter it, and a varnish over the printed numbers so ink cannot migrate upward. The scale of the method is large. A European patent from the industry's largest ticket printer notes that [billions of scratch-off products are printed every year](#)^[4], including contests, phone cards and gift cards. You rarely need lottery-grade security on a promotion. You do need the same logic: absorb, scatter and confuse, in that order.



How to Stop Scratch Off Codes Showing Through: 7 Steps

Work through these steps in order. The early ones cost almost nothing and remove most of the risk. The later ones add cost and are worth it only when the hidden content has real value.

Step 1: Classify what is under the panel

Sort every job into one of three tiers before choosing materials. Tier A is a surprise reveal, such as a gender reveal, a party game or a classroom reward. If someone reads it early, the moment is spoiled,

but nothing is lost. Tier B is a prize or discount code, where an early read lets people pick winners or redeem codes they did not earn. Tier C is a PIN, an activation code or stored value, where an early read means theft. Tier A needs opacity. Tier B needs opacity plus confusion patterns. Tier C needs all of that plus tamper evidence, covered in [the peeling section](#) below.

Step 2: Make the hidden print low-contrast and flat

This is the cheapest fix and the one most often skipped. Print the code as dark grey on a light grey tint rather than black on white. Print finishers who specialise in scratch-off work recommend this, because a low-contrast solid area gives backlight and raking light almost nothing to separate. Avoid heavy toner builds or stacked UV ink under the panel area, since both leave relief. If codes are handwritten, use a felt-tip or gel marker with light pressure. A ballpoint presses a groove that a coating will outline under angled light.

Step 3: Add a blackout layer under the scratch coat

A blackout layer for scratch off labels is a dense, light-absorbing print, usually black or dark grey, placed between the hidden content and the metallic scratch coat. Ideally a white or light scattering layer sits on top of it, so the silver does not look dull. This two-part structure, absorb and then scatter, is what turns a panel from "mostly opaque" into "opaque under a flashlight." One coating supplier's published guidance suggests starting with an opacifying pigment laydown of at least 30 g/m² and a promotional-grade coat of roughly 30–40 µm. Treat those figures as a starting point for proofs, not a guarantee. The right values depend on your stock and the coating system, so verify them with the light tests below.

Step 4: Use pattern masking so partial reads fail

Opacity is never perfect. Pattern masking accepts that and makes any faint image useless. Print a dense, random field of character-like shapes, crosshatching or noise in the same ink density as the code. You can place it around the code, behind it on the card reverse, or as a printed layer on the underside of the panel. Under backlight, an observer then sees a jumble in which the real characters cannot be told apart from the decoys. For Tier B and C jobs this is the most cost-effective defence against the angled peek, which is the usual way people try to prevent peeking under scratch off panels from working.

Step 5: Oversize the panel, then think about thickness

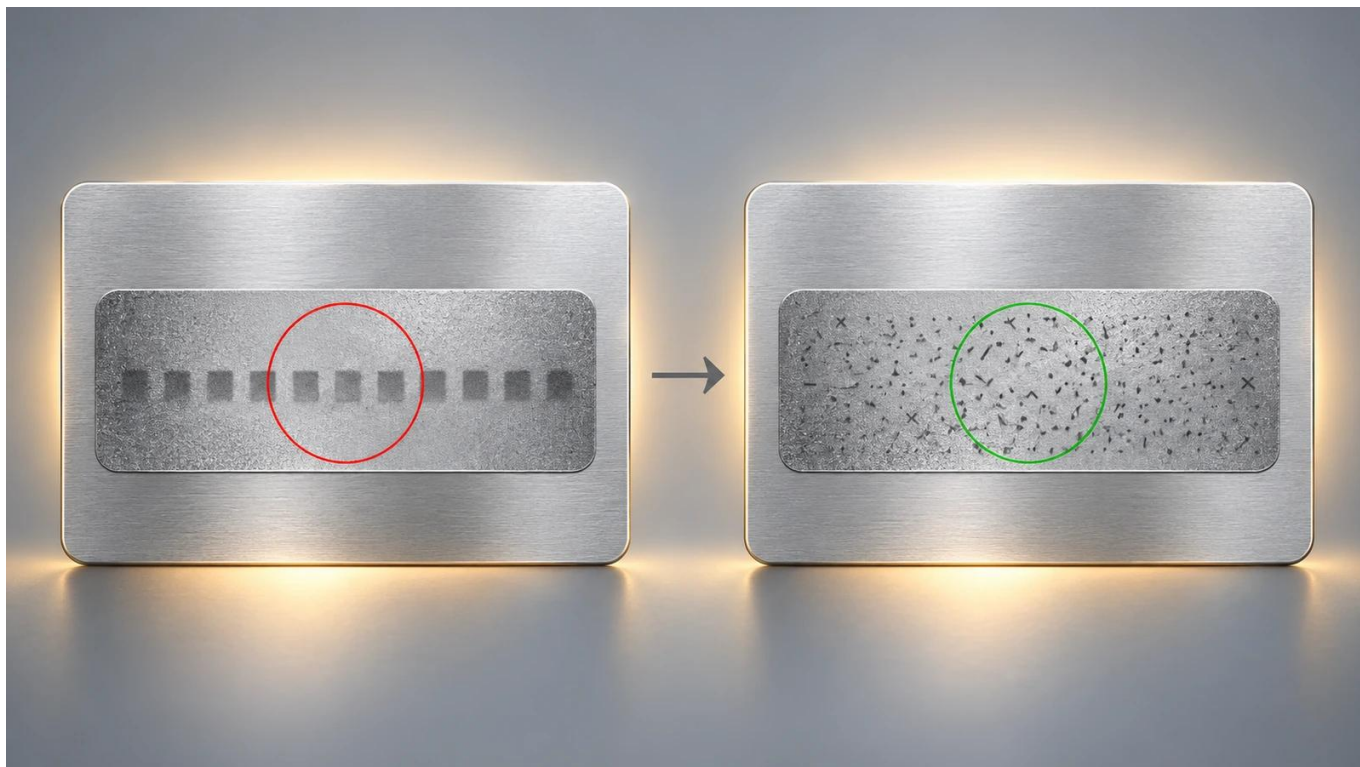
Size the panel so it overlaps the code on every side by more than your worst-case placement tolerance. Hand application drifts more than machine application, so leave a wider margin for hand-applied runs. On thickness, a heavier coat does improve scratch off label opacity, but it also makes the panel harder to scratch. Buyers complain about both failures: panels that are "see through" and panels that are "too hard to remove." Adding a blackout layer usually beats adding coat weight. You gain opacity without making the coin work harder.

Step 6: Treat the card stock as part of the shield

Thin, porous paper lets more light through and gives the adhesive a weaker grip. Overlay sticker guidance commonly points to smooth, heavyweight cardstock (around 80–100 lb). Textured or porous sheets may not seal fully and can tear during scratching. For backlight risk, print a dark flood or the same confusion pattern on the reverse of the card directly behind the code area. That way the card itself absorbs light before it ever reaches the code.

Step 7: Approve on light tests, not on looks

A panel that looks solid at arm's length tells you nothing. Pull samples from the start, middle and end of each production lot, and run the test sequence below before release. Keep the failed samples. They are your evidence when you adjust the blockout or the pattern.



The Scratch Off Panel Light Test, Step by Step

You need a dark room, a phone with a flashlight and camera, a desk lamp you can lower to a near-flat angle, and a hand magnifier. Test production samples, not proofs from a different press or batch. A sample fails if a person can read a full character, or if the phone camera can decode any QR or barcode.

Test	How to run it	What it catches	Pass condition
Backlight	Press the card face-up onto a phone flashlight in a dark room; view from the front	Transmission leaks; thin blockout; thin stock	No character shape visible; masking pattern reads as noise
Raking light	Lower a lamp to a near-flat angle across the panel; rotate the card 360°	Toner relief; pen indentation	No outline of characters at any angle
Direct flash	Photograph the panel with flash from 20–30 cm; zoom in on the image	Reflective contrast differences	Image shows no readable detail after zoom
Camera decode	Point the phone camera's code scanner at the panel, front and back	High-contrast QR or barcode leaks	No decode from any side
Magnifier edge check	Inspect all four panel edges under magnification	Misregistration; undersized panel	No part of any character outside the panel

Test	How to run it	What it catches	Pass condition
Handling rub	Rub panels against each other and against packaging, as in shipping	Pre-worn thin spots that become windows	No thinned or exposed area

The handling rub matters more than it seems. Scuffs from packaging often thin the coat in patches, and a thinned patch is a small window. The card industry treats wear and tampering as separate problems. [ICMA coverage of its 2026 card manufacturing expo](#)^[5] described detection models trained to tell minor print and handling scratches apart from deliberate exposure of security data. Your lot release should do the same thing manually. Log abrasion and show-through as separate defects so you know which layer to fix.



When the Threat Is Peeling, Not Peeking

Everything above stops people from reading a code through an intact panel. It does nothing against someone who lifts the panel, copies the code and puts a fresh one on top. For Tier C content, that is the main attack. Police interviewed by [The Mercury News](#)^[6] described rings that scratched codes, recorded them and covered them with fake scratch stickers whose font and spacing differed only slightly from the original. Retail guidance from [Stop Gift Card Scams](#)^[7] now tells shoppers to check for missing, exposed or replaced PIN scratch covers.

The law is moving the same way. The [National Conference of State Legislatures](#)^[8] counted at least 22 states with more than 30 gift card fraud bills in the 2025 session, several of which target tampering with cards or packaging. In Texas, a [December 2025 state press release](#)^[9] described arrests in a card-cloning case with an estimated \$14 million at stake and more than 400 cards seized. The method was to open packaging, record numbers, reseal and return the cards to shelves.

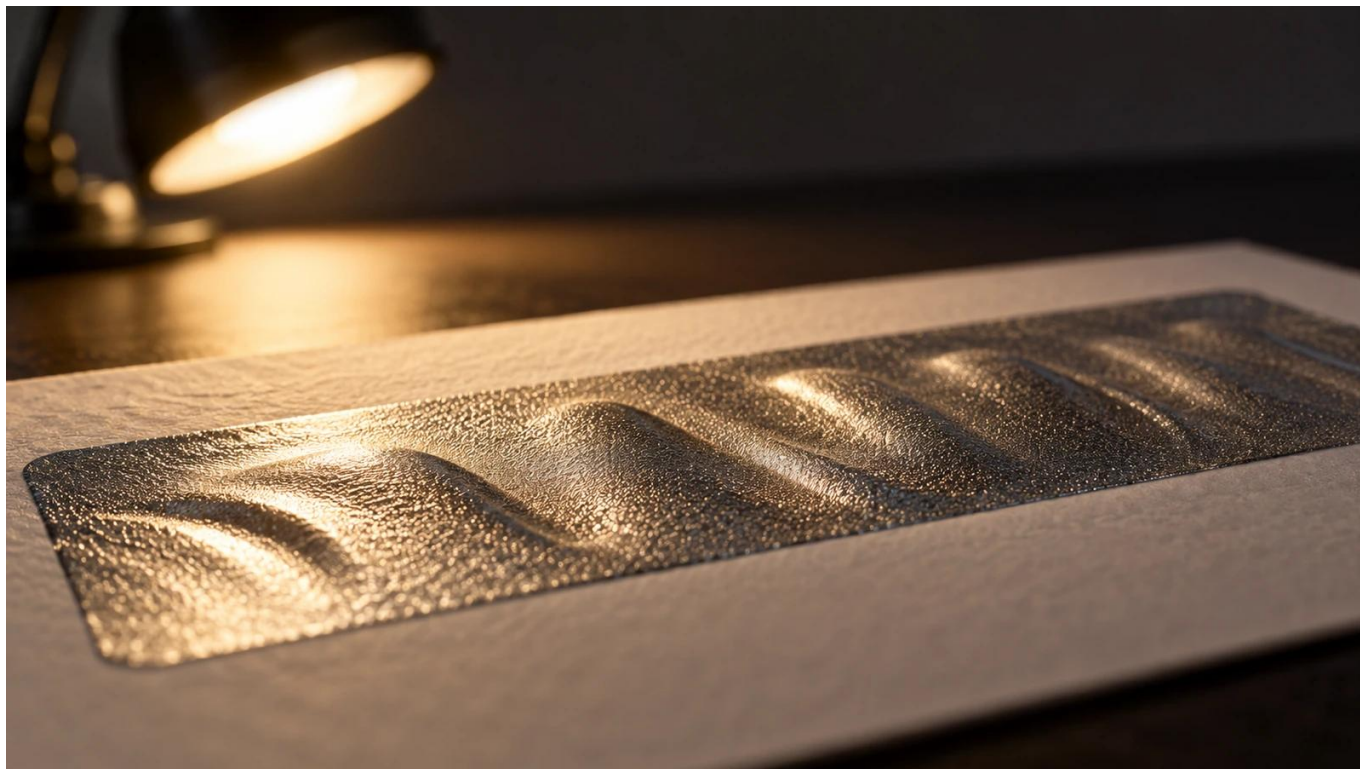
For PINs and stored value, then, opacity is necessary but not sufficient. The panel must also fail visibly when someone tries to lift it. That means destructible film, security slits or an aggressive adhesive that tears the panel apart. A standard overlay sticker that peels off cleanly should not guard money. If your project sits in this tier, tell us when you request a quote, so the specification starts from tamper

evidence rather than reveal appeal. The format trade-offs are summarised on the [scratch-off overlay sticker product page](#).

Comparison: Which Countermeasure Fixes Which Leak

Countermeasure	Stops	Does not stop	Trade-off	Use for
Low-contrast, flat underprint	Backlight shadows; raking-light relief	Peel-and-replace	Code is less legible after scratching, so check readability	All tiers (default)
Blockout layer (absorb + scatter)	Transmission through panel	Relief; edge leaks; peeling	Extra print pass	Tier A and up
Pattern masking	Partial reads at angles and under backlight	Full panel removal	Design time; must match code ink density	Tier B and C
Heavier scratch coat	Some transmission	Relief; peeling	Harder to scratch; more debris	Only when blockout alone is not enough
Oversized, registered panel	Edge leaks	Transmission; peeling	Needs layout room	All tiers
Dark reverse flood	Backlight through thin stock	Front-side relief	Uses reverse print area	Tier B and C on lighter stock
Destructible or holographic security panel	Peel-and-replace; copying the panel	Poor underprint design	Higher cost; more sensitive to the surface it is applied to	Tier C

Holographic foils earn their place in the last row for a specific reason. A European patent on secure optically variable labels notes that holographic scratch-off foil is [hard to replicate or obtain^{\[10\]}](#), which protects numbers from alteration, prior use and resale. Its value lies in being hard to copy, not in hiding better. A thief can buy plain silver stickers but cannot easily match your hologram.



FAQ

FAQ: Can I stop show-through by stacking two overlay stickers?

Usually not. Two weak layers still let light through, as buyers who tried it report. Stacking also adds a raised edge that tends to lift during scratching. One panel with a proper blockout layer beneath it hides more than two panels without one.

FAQ: Why can I read the code at an angle but not straight on?

You are reading relief, not ink. Toner, UV ink and ballpoint grooves change the surface, and the coating follows that shape. Switch to flat, low-contrast underprint or a light-touch marker. Opacity upgrades will not solve this one.

FAQ: Do gold or holographic panels hide better than silver?

The finish color matters less than what sits under it. A silver panel with a blockout layer outperforms a gold panel without one. Holographic panels add value through being hard to copy, which matters for PINs, rather than through extra opacity.

FAQ: Are QR codes riskier to hide than text?

Yes. QR codes use large, high-contrast modules and include error correction, so a phone camera can sometimes decode a faint shadow that a person could not read. Always include a camera-decode test from both sides of the card.

FAQ: Is an opaque overlay sticker enough to protect a gift card PIN?

No. Opacity stops peeking, but the documented attack on retail cards is lifting the cover, copying the PIN and replacing the cover. PIN-tier jobs need a destructible or slit security panel plus retail inspection, as described in FTC guidance.

FAQ: How often should we run the light test?

Run it on every new artwork, every change of stock or coating, and on samples from the start, middle and end of each production lot. Coating weight can drift within a run, and a thin spot near the end of a roll is a common source of escapes.

Key Takeaways

- **Opacity comes from layers, not just from silver ink.** — Instant tickets use 2 hiding layers (a black absorber and a titanium-dioxide white scatterer) plus a varnish over the numbers ([Source](#))
- **Scratch-off concealment is a mature, high-volume technology, so proven methods exist to copy.** — Billions of scratch-off products are printed every year ([Source](#))
- **For PINs, peel-and-replace matters more than see-through.** — One Texas case involved an estimated \$14 million and more than 400 seized cards ([Source](#))
- **Tampering with card packaging is becoming a specific crime.** — At least 22 states considered more than 30 gift card fraud bills in 2025 ([Source](#))
- **Exposed codes cost real money when the code is stored value.** — More than 41,000 reports and \$217 million in reported gift card losses in 2023 ([Source](#))

Conclusion

Codes show through for three reasons: light passes through the panel, the surface reveals the print underneath, or the panel does not fully cover the edges. Each has a cheap fix if you plan for it before printing. Use flat, low-contrast underprint, a blackout layer beneath the scratch coat, a masking pattern that turns faint images into noise, and a panel with margin on every side. Then confirm the result with the backlight, raking-light, flash and camera tests on real production samples. For prize codes and PINs, add tamper evidence, because a perfectly opaque panel that peels off cleanly still leaks the code.

If you are planning a promotion, reward-card or prepaid run and want the panel structure set correctly from the start, review our [custom scratch-off overlay stickers](#) and send us your artwork and content tier. We will quote against your actual hidden content rather than a generic spec.

Footnotes

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October 21, 2026