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Conference**

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St Louis, MO

General Overview of Overt & Covert Security features for Brand Protection in Inks and Coatings.

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Label font for product name and concentration is narrower



Label font for product name and concentration is rounder



AMGEN COUNTERFEIT
 AMGEN

Crisp, high-quality print on box



Experts say 10% of the world's drug supply is counterfeit.

Can we be sure we import the 90% that isn't?



As you read this, Congress is considering legalizing the importation of drugs from more than 20 countries. But there are real risks involved. The World Health Organization estimates that 10% of the world's drug supply is counterfeit—60% in some developing countries. Counterfeits can be dangerous—made and distributed by criminal organizations to resemble familiar drugs, and may have too much or too little medicine.

So what safeguards would we have? The U.S. Food and Drug Administration (FDA) warns that an avalanche of incoming drugs would overwhelm them. Since imported drugs, and potential counterfeits, would be mixed in with our domestic supply, neither you nor your pharmacist would necessarily know when you're buying imported drugs. We invite you to do your homework. Do the math. And see if drug importation adds up for you.



Global Counterfeit Issues

- Counterfeiting costs legitimate businesses upwards of 500 billion USD per year
- This type of crime is among the fastest-growing in the world
- Penalties for intellectual property rights violations are mild compared with other types of crimes



“The overall costs of global counterfeiting are estimated to be 5-7 percent of global trade”

- source: OECD



Global Pharma Counterfeiting

**Up to 10 percent of
all high-tech products
sold worldwide are
phony**

- source: AGMA

**The WHO estimates the sales of counterfeit
drugs to be worth \$40 billion in 2006.**

**...up from the \$32 billion estimate published
by the WHO in 2003.**

**Forecasts predict the global market for
counterfeit drugs will reach \$75 billion in 2010**

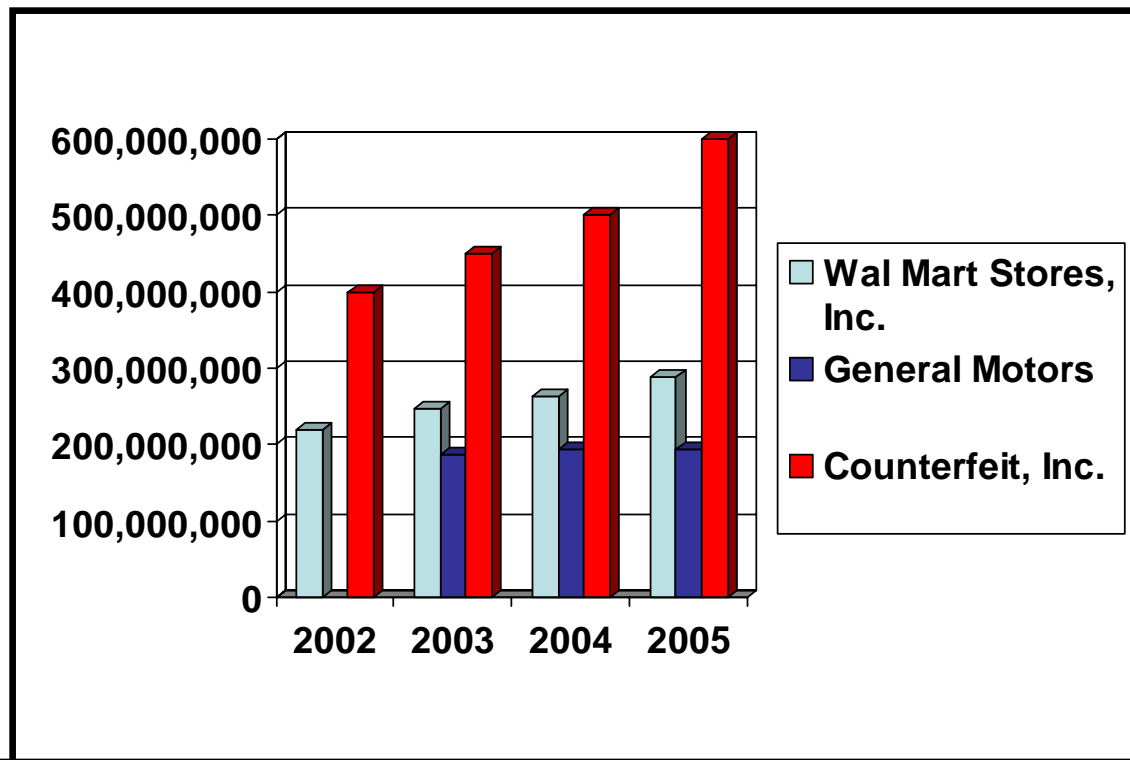
- source: World Health Organization



Did you know?

If counterfeit trade were a legitimate business; annual sales would top Wal Mart Stores, Inc. *and* General Motors *combined*.

(Numbers 1 and 3 respectively on The Global 2000 list)



As a GDP; counterfeits would be the 18th largest Nation in the world...

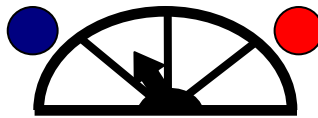
...between Australia and Turkey



Covert



Semi-covert



Overt



Layered Authentication Solutions



Track and Trace Solutions

Security Features

Overt layers readily apparent to the authenticating party

Semi-covert layers require foreknowledge and action

Covert layers Taggant/reader systems. Optical systems, Magnetic systems, DNA based inks, Forensic analysis

Taggant/reader system for simple authentication

Camera reader for variable data capture

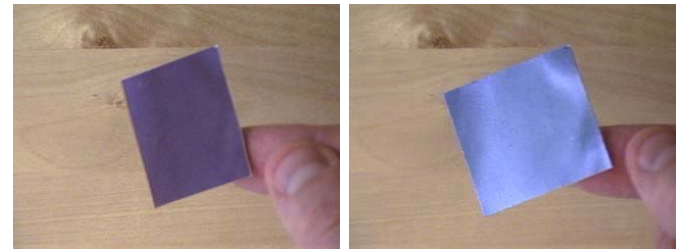
Overt Security Features

- Color Shifting Inks
- Pearlescent inks
- Holograms
- Watermarks



Advantages of Overt

- Instant verification
- Predictable, repeatable behavior
- Secure alone or as a layer
- Angle of light response
- Persistent or disappearing
- No Device is needed for authentication



Color shifting ink



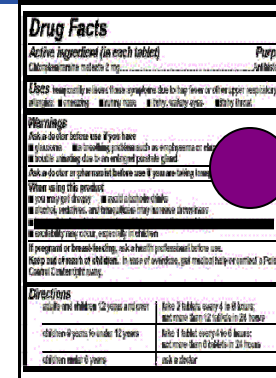
Holograms

Semi Covert Inks

- **Thermochromic Inks**
- **Coin Reactive Inks**
- **Metameric inks**
- **Photochromic inks**
- **Chemical markers**
- **Micro printing**

Advantages of Semi-Covert Features

- Instant verification
- Reversible or Irreversible
- Unique/proprietary behavior
- Secure alone or as a layer
- Requires foreknowledge and action



Thermochromic



Incandescent light



Fluorescent light

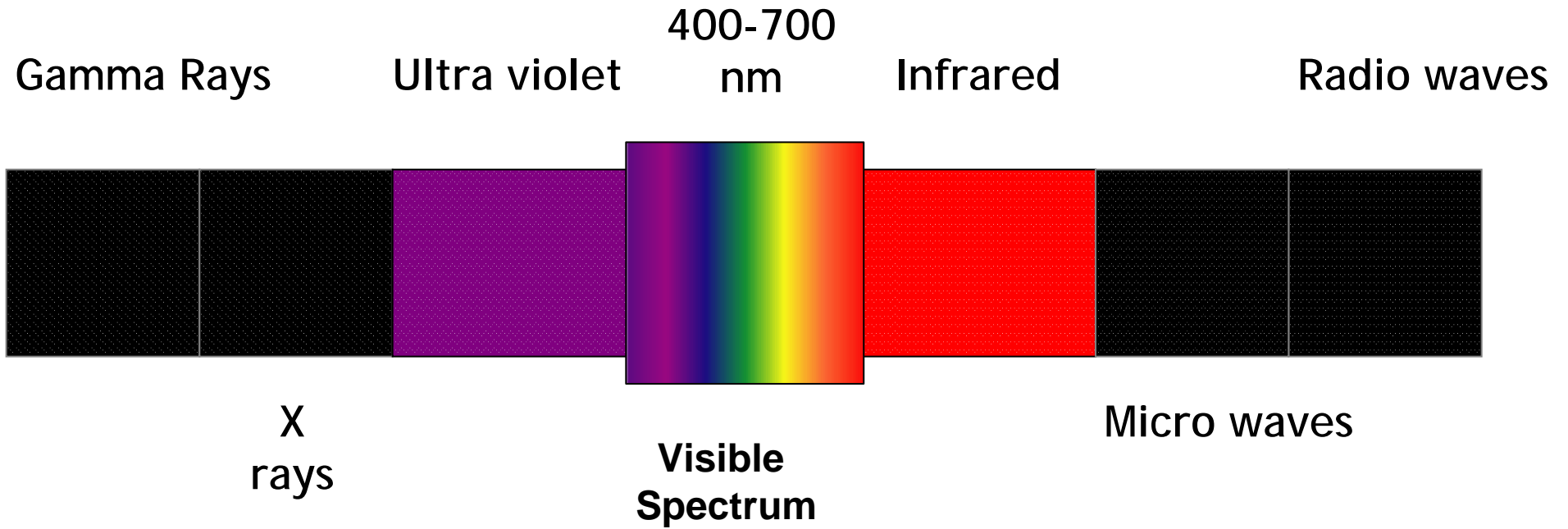
Metachromic inks

Covert Inks

- **UV responsive inks**
- **IR responsive inks**
- **UV/IR responsive inks**
- **Magnetic inks**
- **Machine readable taggants based inks**
- **DNA based inks**

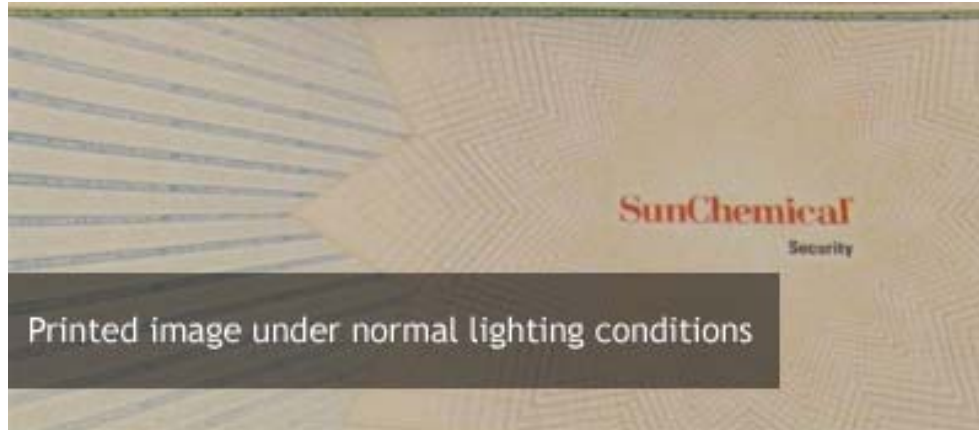


Light Spectrum



UV/Inks

Print invisible messages on packaging



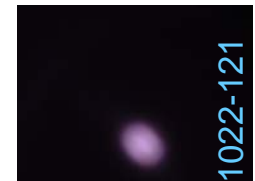
Visible or invisible lower level security layer



- Short wave/Long wave/dual responsive
- **Invisible/visible**
- Multiple colors
- Multiple print processes

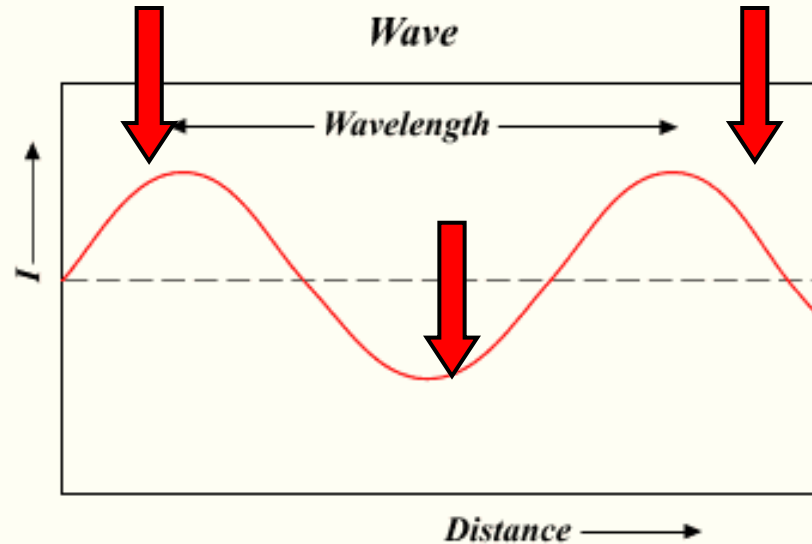
IR to Visible

- Flexible applications
- Works with a variety of print processes
- Proprietary behaviors available



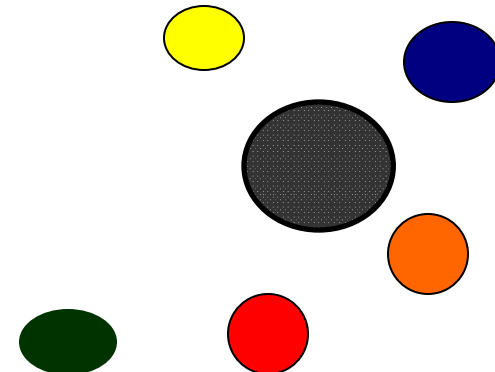
Optical Machine readable Taggants

- UV/IR light energy emitted from reader
- Wavelength response is read
- If wavelength response matches calibration of reader ink is authentic



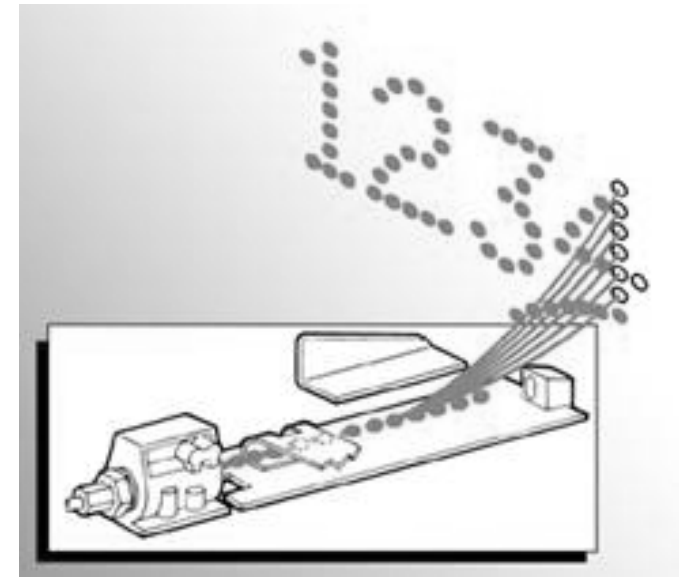
Magnetic Based Taggants/reader systems

- **Physics based system - not chemistry based.** Analysis and substitution of materials is not possible
- **“Handheld MRI”.** Uses similar technology called Magnetic Resonance Imaging
- **Non line of site.** Can read through primary to secondary packaging.

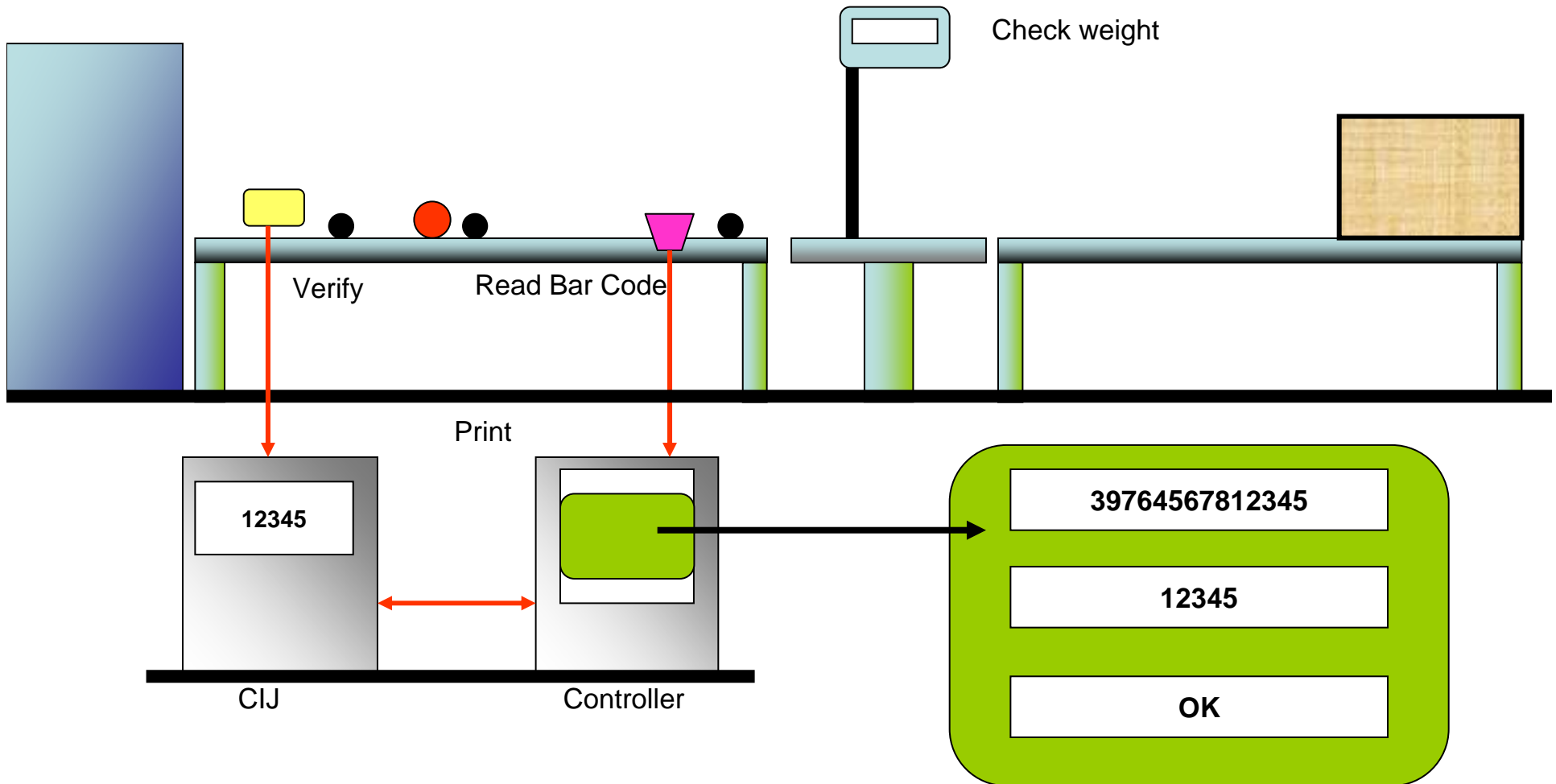


Invisible Coding Strategies

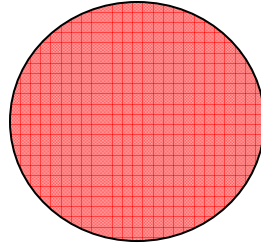
- Use batch code for tracking
 - Illegal in 30 U.S. States to remove
 - Recall information is obliterated
- Print over trademarked logo
 - More global Trademark law than IP protection
 - Violates agreements
- Print over ingredients
 - Consumers won't purchase
 - Retailers won't carry products
- Multiple codes/Overt and Covert
 - Diversionary tactics



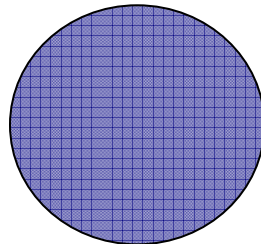
Variable data using Inkjet



Layered Authentication

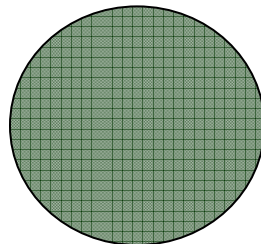


Covert Authentication



Semi-covert Authentication

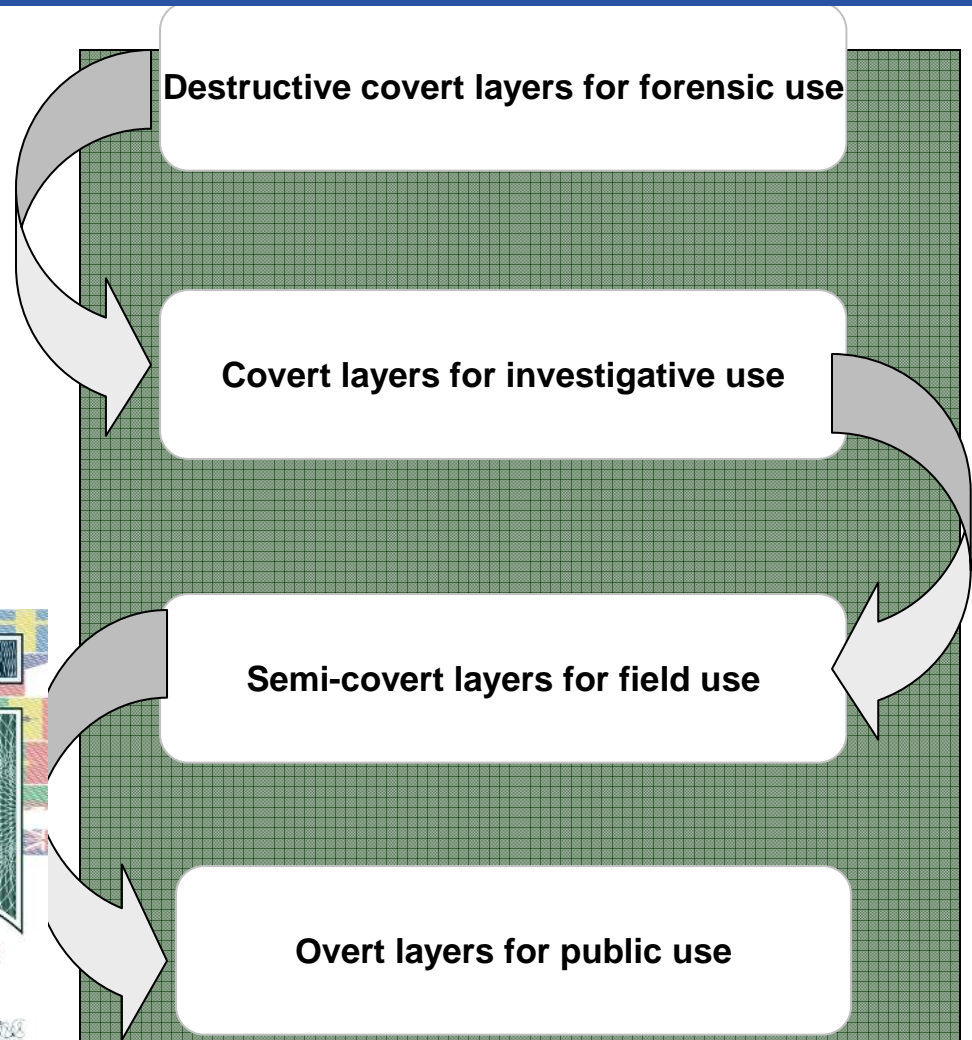
Very difficult to copy

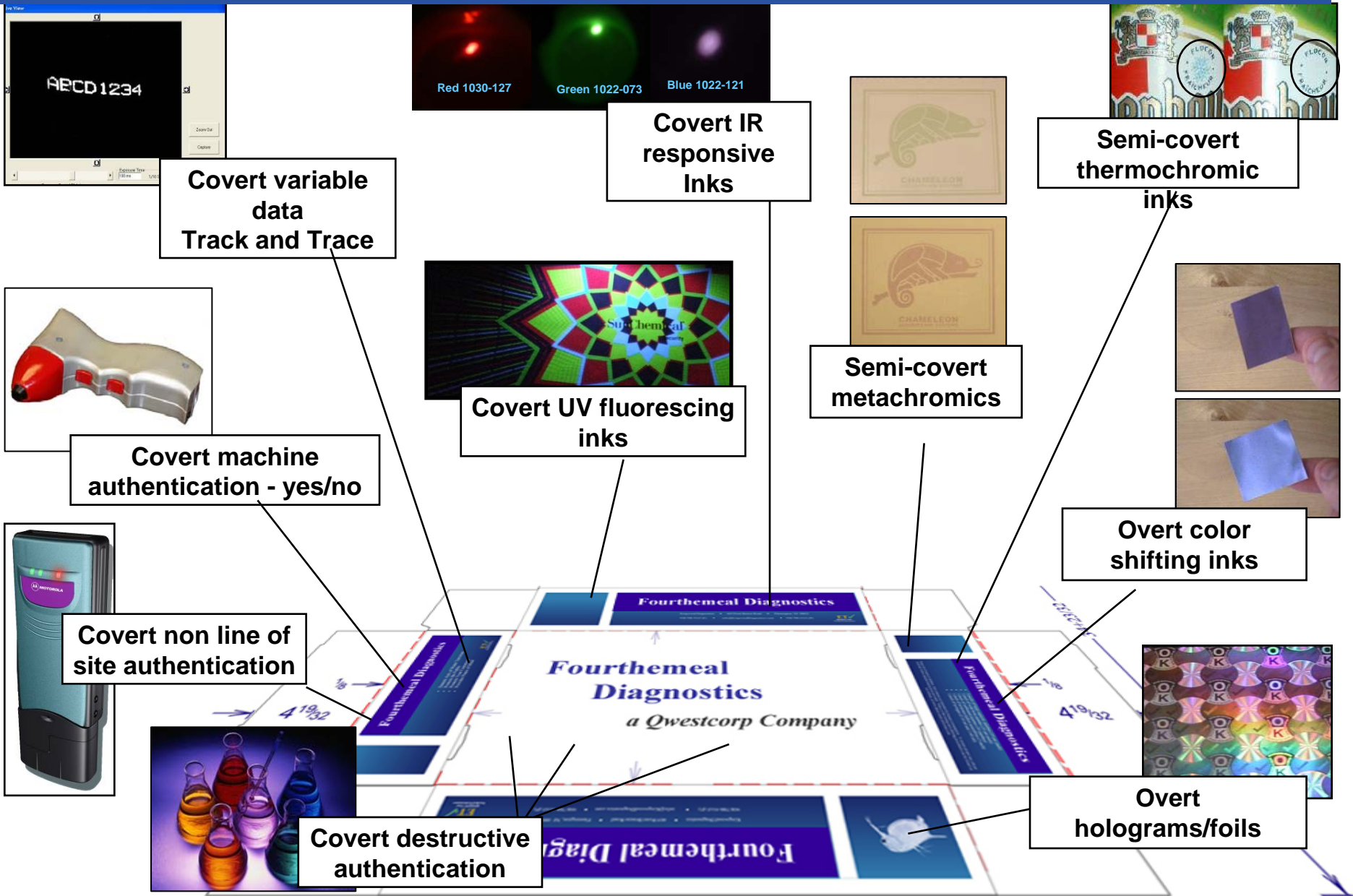


Overt Authentication

Benefits of Layered Authentication

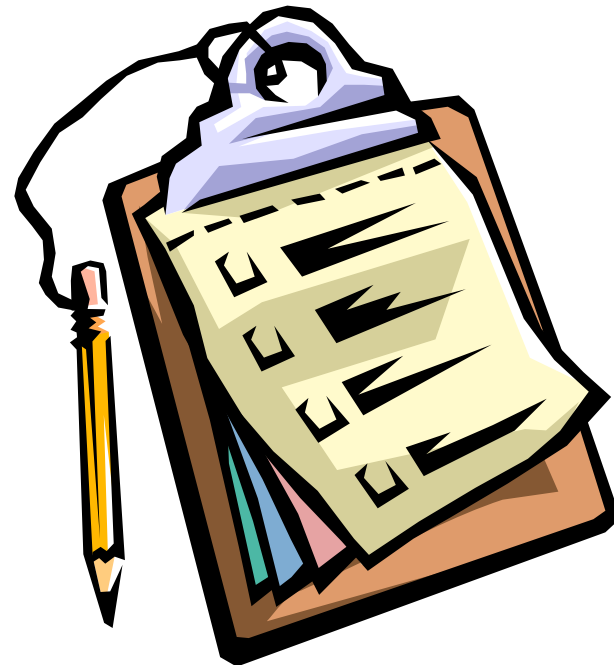
- Same philosophical model as currency
- Significant barrier to counterfeit or simulation
- Provides end-users with cross functional value





Thank You

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*Please remember to turn
in your evaluation sheet...*