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

Presented by:
Rakesh Vig Ph.D.
Manager Research & Development
Sun Chemical Security
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 legislation to stop the importation of drugs from more than 20 countries. But there are red flags involved. The World Health Organization estimates that 10% of the world’s drug supply is counterfeit – 60% in some developing countries. Counterfeit drugs 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 ounce 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 set 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
Layered Authentication Solutions

Covert

Semi-covert

Overt

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
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 light
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

Gamma Rays  Ultra violet  400-700 nm  Infrared  Radio waves

X rays  Visible Spectrum  Micro waves
UV/Inks

Print invisible messages on packaging

- 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

- Verify
- Read Bar Code
- Check weight
- Print

CIJ

Controller

39764567812345
12345
OK
Layered Authentication

- Covert Authentication
- Semi-covert Authentication
- Overt Authentication

Very difficult to copy
Benefits of Layered Authentication

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

Destructive covert layers for forensic use
Covert layers for investigative use
Semi-covert layers for field use
Overt layers for public use
Covert variable data
Track and Trace

Covert machine authentication - yes/no

Covert UV fluorescing inks

Covert IR responsive inks

Semi-covert thermochromic inks

Semi-covert metachromics

Covert destructive authentication

Covert non line of site authentication

Overt color shifting inks

Overt holograms/foils
Thank You

PRESENTED BY
Rakesh Vig Ph.D.
Manager R & D
Sun Chemical Security
Rakesh.vig@sunchemical.com

Please remember to turn in your evaluation sheet...