

Tailored Defense

Self-adhesive laminates in brand protection:

A converter's reference guide to solutions for anti-counterfeiting, tamper-evidence, and anti-theft protection.

Brand protection covers both reality and perception: It involves guaranteeing the integrity of a product by discouraging counterfeiting or tampering and provides customers the peace of mind of buying a product that meets their needs in terms of perceived purity, safety, and authenticity.

The threat of product tampering or counterfeiting is unfortunately a reality today—particularly in such fields as high-value spirits and other alcoholic drinks, perfumery, fashion clothing, sporting goods, computers, software, and electronic goods in general, as well as automotive and other engineering product components. Some companies estimate that 10% of the products sold under their brand names are counterfeit.

Counterfeiting is also a problem in the world's developing economies: Russia's Patents Agency estimated recently that in excess of 40% of all vodka carries a fake label, and multinational companies active in Russia—some of which have banded together to form an action group—quantify the costs of counterfeiting (including legal costs) at more than \$1 billion/annum.

Under these circumstances, it is hardly surprising brand owners are willing to pay whatever is necessary to protect their brands with security labels—and roll-fed, self-adhesive technology is their first choice and the most flexible, variable, available option.

A Matter of Degree

The questions a brand owner needs to consider when evaluating the addition of security features to a particular product's packaging are the degree of protection required, the budget, and the compatibility of the chosen solution with the company's production, packaging, IT, and logistics systems. Most of the available solutions at all levels, from simple to sophisticated, involve a self-adhesive laminate and can be converted readily on narrow web presses. The "special ingredients" necessary are relatively easy to source today. Security labeling in all its forms is a lucrative, added-value niche market for label printers in a marketplace where margin can be difficult to come by.

Whatever a brand owner's needs, capable security label converters are key to translating those needs into what often can be a customer-specific solution. This is particularly true of the self-adhesive label, which has proven to be the most flexible "carrier" of security devices of all kinds. The key is the almost infinite variability of the self-adhesive laminate (face material—paper or film—plus adhesive and release liner).

Seal Security

The label facestock itself can be fragile and therefore tamper-evident. Security devices and taggants also can be embedded under or on top of the facestock, or even printed onto it. Taggants can be added to the adhesive layer, and the intrinsic strength of the silicone-coated release liner ensures labels will be located accurately on the packaging for optimal performance and scannability.

There is an extraordinary choice of methods based on self-adhesive technology that will identify clearly when a label, seal, or closure has been removed, opened, or otherwise changed. Standard paper label constructions with a low internal strength, coupled with an aggressive permanent adhesive, can be perfectly adequate for some requirements, but additionally there are specialty stocks for critical applications. These include ultra-destructible papers and films and a full range of thermal transfer and hot laser printable "VOID" polyester materials in white, transparent, and silver (with customer-specific imprints available on request). These films reveal a hidden "footprint" on both label and substrate when the label is removed or tampered with and can visibly display the word "VOID" or other customer-specific wording, or where required, leave a message on the substrate that is readable only with a UV light source. Simple heat-shrinkable, self-adhesive cap seals are another option.

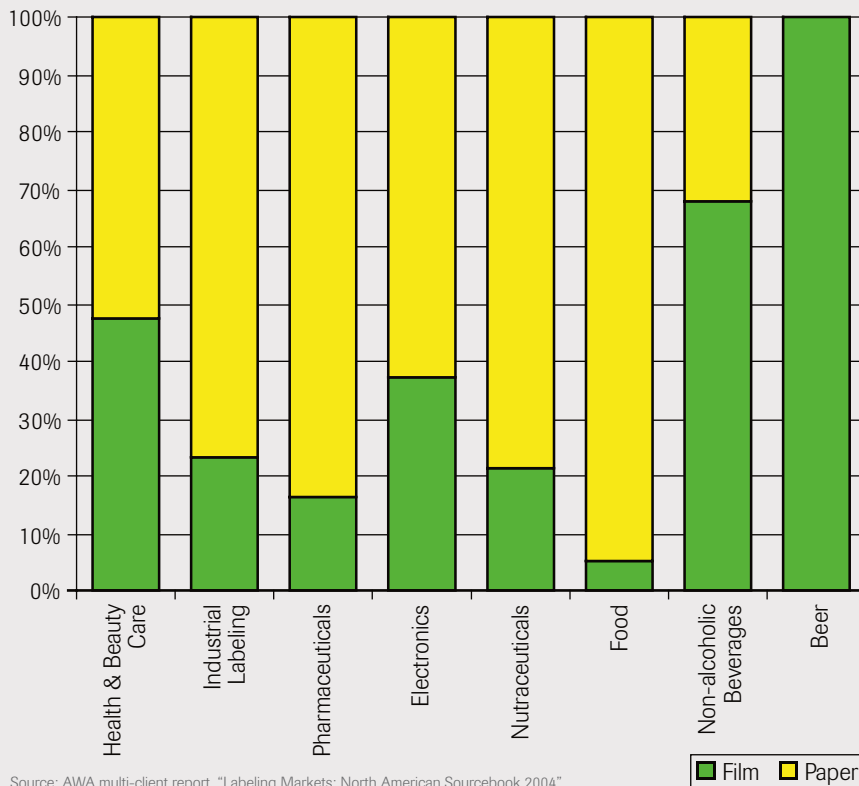
Customized Solutions

Security label solutions based on special facestock treatments can be sourced from leading self-adhesive label stock suppliers such as Raflatac's Rafsec and Avery Dennison's Fasson Specialty portfolios. With all the security technology contained in the label stock, the converter's job is simply to create the right label for the task on hand. Options include two- or three-dimensional customer-exclusive "watermarks"—nylon fibers of a specific length or color, readable only in UV or IR light—in the label face paper or film. Metal strips or fragments, which can be either highly visible (e.g., iridescent) or invisible to the naked eye,

Paper or Film? Tailoring Your Security Solutions

AWA's research indicates there are distinct preferences in the major end-user markets in terms of self-adhesive facestock. These will influence the choice of security device, as this chart shows.

Paper & Film Self-Adhesive Facestock by Selected Market Segment



also can be embedded in the facestock. Polyester security threads, thermochromic threads, and micro-marked fibers are other possibilities. Solvent-sensitive papers, developed to prevent information from being removed with solvent, also are available: They react visibly to any solvent contact. Special iridescent security color stripes, impossible to reproduce by color copier, offset process, or PC printers, can be applied to some paper facestocks to prevent counterfeiting. Using near-IR fluorophores, chemical taggants, or microtaggants (even DNA), state-of-the-art covert (invisible) product identifiers, accessible only via special scanners, also can be built into the label construction. Banknote print and security inks can support and enhance these features.

Optically Variable Device (OVD)

Based on hologram technology, OVDs are a popular method today of achieving product security, either using standard or self-adhesive film, foil, or paper products, or through customized "wallpaper" designs, logos, or brand names.

The most popular form of OVD, the DOVID (Diffractive Optically Variable Image Device), includes all the holographic options. Developed from decorative metallized applications to enhance on-shelf packaging appeal, they actually can combine this attribute with the more important security functions at a reasonable cost. There is even an ink available today from XSYS Print Solutions, HolographINK, which makes the process even simpler for the label converter. Holograms are well used in the pharmaceuticals industry (Glaxo was among the first to employ the technology many years ago to provide a holographic, self-adhesive seal for packs of their Zantac medication and still use it today), and as seals on CD jewel cases in the music industry.

Production of high-security DOVIDs is computer-based and can be very technical, but sophisticated brand authentication can be achieved using these devices in all their various forms. They can be three- or two-dimensional holographic images (cost is the only restricting feature) created using diffractive metallized films and pa-

pers. They can include image changes (simulated movement) and also emulate the security features of banknotes, including micro-lettering and other covert features that are virtually impossible to copy. They also can be included in the product's bar code.

Today, in-store electronic inventory surveillance to minimize inventory "shrinkage" is achieved using three main technologies: electro-magnetic, radio-frequency, and acousto-magnetic systems. All require very tightly specified security tag solutions. In a self-adhesive laminate, carriers for the thin metal strips that represent the security taggants can be coated or uncoated papers, thermal papers (for bar code and other variable information print), or films. An opaque layer of permanent, high-tack adhesive holds and conceals the security elements.

RFID: The Future?

For full product traceability and anti-theft protection, the RFID (Radio Frequency Identification) tag can offer the leading-edge solution in the form of a highly compact transmit-receive coil antenna circuit, transponder microchip, and capacitor. The tag can be scanned at any point in the supply chain and the resultant

Continued on page 44

Continued from page 43

data relayed back to a host computer and verified. Again, the self-adhesive laminate has proved the ideal carrier for RFID chips, and this is genuinely an opportunity market for roll converters.

The EMID Alternative

An alternative technology is now developing alongside RFID—EMID (ElectroMagnetic Identification). The system is particularly interesting for authentication of high-value pharmaceuticals. EMID tags, embedded in, for example, a blister pack or a wrap-around self-adhesive label, can be scanned through other exterior packaging materials without breaking the tamper-evident pack seal. A further advantage is that, for added security, it can be linked to a bar code on the outer packaging to create a unique identity for the pack as a whole.

Making the Choice

Security taggants can, and do, provide the solution that manufacturers want for the authentication of their brands, for tamper-evidence and for anti-theft protection. The challenge for brand owners is to define the nature of the solution they require; to set it in the context of their manufacturing, packaging, and supply chain systems; and to establish an appropriate budget. The security industry—from the electronics specialists and other raw material suppliers, through the self-adhesive laminators and ancillaries suppliers, to the narrow web self-adhesive label printers that will finish the job—is more than qualified today to do the rest and make a good profit.

Conference to Focus on Brand Security Solutions

There is no more dynamic area than product authentication and brand security. This is true particularly in the emerging economies, where the drive to make money by counterfeiting everything from medicines to sporting goods and automotive aftermarket parts is strong. The consequences cost brand owners millions—and in some cases, cost consumers their lives.

The AWA Product Authentication and Brand Security Conference (PABS) is held annually in North America, this year in Hilton Head Island, SC, October 3–5. It will focus on the challenges facing the industry but, more importantly, on the many opportunities and solutions to those challenges that experts in brand security and product authentication at all stages of the supply chain can provide.

The conference agenda will cover topics of value to regulatory and legislative authorities, security solutions providers, material suppliers, coaters and laminators, converters, and of course, the brand owners and their retailers. In addition, an important industry alliance will be launched during PABS 2005.

Details are available via the AWA Web site, awa-bv.com.

Continued on page 46

Forensically Invisible Brand Protection

Secure & cost-effective anti-counterfeiting solutions are being developed to foil the fakers.

Chemical analyses or mass-spectroscopy analyses can be obtained easily by anyone willing to pay \$250 and send a sample of the material to be analyzed to any of the thousands of independent laboratories across the world. No credentials are needed except the ability to pay. In today's high-tech counterfeiting market, this is how high-tech product fakers identify any covert anti-counterfeiting taggants they need to copy in a system to pass off their goods as the real thing.

In practice, any taggant that is present above 10 parts per million (ppm) is detectable by inductively coupled mass spectroscopy systems, and above 100 ppm is detectable by gas chromatography and even other simple chemical analyses. Product manufacturers are paying for advanced protection of the authenticity of their valuable brands, but until recently the counterfeiters have been a step ahead of them.

Invisible Tagging System

To overcome this major problem for brand owners, a unique tagging system has been developed by Creo, a sub. of Kodak, that is invisible even to forensic trace methods. This invisible system, Traceless, is used to provide covert, high-speed, machine-readable (readers are capable of 100 reads/sec), anti-counterfeiting features on their labels and packaging.

Most taggant-based systems require the taggant to be added at levels of 3,000–10,000 ppm in order to be reliably detectable for product authentication. The new taggant system, when added to

paper, film, coatings, inks, or molten metals and plastics at <2 ppm, remains forensically invisible. This is a key requirement for long-term sustainability of high-security, anti-counterfeiting systems.

Additionally, the new system can track individual packages, bottles, or labels via an "invisible bar code"—a taggant image signature created by the positioning of the taggant particles, which is said to be a truly random pattern occurring from the fluid dynamics of printing inks, coatings, and papers into which these new taggants are added. The system reportedly is so secure that it cannot be reproduced, even by the manufacturer. This "bar code" acts as an invisible identifier for individual packages, bottles, or labels for tracking and tracing to militate against gray-market diversion.

The combination of these two powerful security factors has made this system attractive for many high-value industries such as prominent US drug manufacturers. Additionally—and critically—the necessary software database workflow for tracking and tracing individual items also is available. A brand manufacturer purchases the database system and is the only one with access to the company's database of "official product codes."

Secure RFID Antennae

RFID is today's buzzword in terms of track and trace logistics systems, but concerns have been expressed that printed antennae are not completely secure. Their easily broadcast signal can be captured and counterfeited. The new invisible system has the ability to provide robust track and trace features similar to those of RFID—thanks to the taggant particle positioning that is unique to each package or label (the invisible bar code)—at a fraction of the cost of RFID.

Working with XINK Laboratories, a new generation of covertly tagged conductive flexo inks has been developed that confer the same degree of security on an RFID antenna as you would attribute to a banknote. The low-concentration taggants permit full authentication of every RFID tag using a simple pen-sized reader—and the RFID tag reading, ink properties, and print characteristics remain completely unaffected.

Just two examples of where there is interest today include unique identifiers on postage stamps that would enable tracking of individual pieces of mail from the purchase of the stamp right through to delivery to the addressee and on passports and other critical identity documents. The possibilities could be endless.

Supplier Information:

Creo, a sub. of Kodak—PFFC-ASAP 312. creo.com/traceless



A new anti-counterfeiting tagging system includes readers capable of 100 reads/sec and taggant (in vial) that is invisible to forensic trace methods.

Two Products Offer Protection

**Sherwood Technology, Widnes, Cheshire, UK;
+44 1606 837787; sherwoodtech.com**

The DigiVU range of products reportedly provides sophisticated features for the protection of products, brands, and documents. The first product is Microread, which uses a combination of proprietary chemistry, a variable, tunable laser source, and precision control system to form a series of unique, overt, semi-covert features within a document. Also available is the DigiVU OVD, featuring a tilt-activated, optically variable device to apply an overt image on metallic substrates. The image changes from positive to negative when viewed at different angles to incident light.

PFFC-ASAP 384



Protect RFID Tags and Labels from Static

**Simco Industrial Static Control, Hatfield, PA; 215/822-6401;
simco-static.com**

The fusION neutralizer is recommended for protecting RFID tags from damage by delivering powerful and balanced static control in a compact package that can be installed in places where typical ionizer designs do not fit. The tiny circuits of RFID tags may not be robust enough to withstand exposure to static charges, company explains. Protecting them requires an active (electrical) static eliminator that can provide relatively balanced ionization (probably less than 500 or 600 volts of ion current).

PFFC-ASAP 385

Security Inks Foil Counterfeiters

**XSYS Print Solutions, Stuttgart, Germany;
800/328-7838; xsys-printsolutions.com**

In a partnership with Microtrace, company offers a traceable, anti-counterfeit ink technology for the narrow web tag and label industry. Microtaggant security inks reportedly allow any printer to apply the technology easily to any printed materials using flexo or screen printing processes. The technology comprises a numeric code sequence in a multiple colored layer format, delivering multiple layers of security through a single microscopic particle. The inks are formulated with Microtaggant encoded particles that are certified and registered to each customer or application. Once a formulation is produced for a customer, it becomes their exclusive "fingerprint" and is never again used for any other application. The ink system is fully compatible with company's UV products.

PFFC-ASAP 386

Continued on page 49

Continued from page 47

Coatings Aid Security

Starna Industries, Essex, UK;

+44 (0) 20 8599 5115;

starnaindustries.co.uk

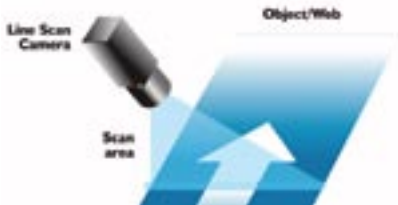
Curecoat and Curecoat HV water-reducible primers are environmentally friendly, water-based coatings developed for high-gloss problems, problematic substrates, or low-dyne substrates. They are said to smooth variables and provide for uninterrupted production, thus making them well suited for security and brand protection. Curecoat coatings can be applied by flexo/roll-coat and gravure; Curecoat HV is applied by screen and litho print processes. Company says both dry quickly due to the low film weight, and treated substrates have a satin-like finish.

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Verify Labels, Documents

Lake Image Systems, Fairport, NY;

585/421-9290; lakeimage.com



IntegraScan provides secure printing industry with a line scan-based data verification/reporting solution that proves the integrity of piece-level production for continuous printing applications. Product images entire web/sheet with a single camera, providing verification in real time, even for multi-up applications. Capabilities include comparison of production to print file information; identification of missing/duplicate pieces; front/back matching; basestock verification; print quality inspection; data acquisition for ADF environment; pin number logging; and production integrity reporting. Designed for pharmaceutical/security labels, high-security forms printing, tickets, and more.

PFFC-ASAP 388