It is the ink that matters
At the forefront in fighting counterfeiting

Nano-based ink technology against counterfeiting and tampering

The Department of Applied Biology and Chemical Technology has developed a novel ink technology for printing on plastic and metal surfaces such as paper packaging and metal container. This innovative ink technology can protect our foods and drinks against counterfeiting and tampering. The new tamper-resistant ink is also easy to implement and operate in packaging lines, allowing manufacturers to take effective action against counterfeiting, which also undermines consumer confidence and reputation they are trying hard to build. This emerging ink technology will become a powerful tool to ensure products on the shelf that are safe and secure for use.

Counterfeit foods and beverages are difficult to detect once they have made their way into stores. How can consumers be better protected?

A new printing ink unveiled at The Hong Kong Polytechnic University would deter counterfeiters. An indelible ink has been successfully developed by researchers from the Department of Applied Biology and Chemical Technology. This new product, namely “Anti-erasing” (ATE) ink, is currently being used to prevent removal of packaging information, thus prohibiting fraudsters to tamper with product labels and packages.

Packages are vulnerable to deliberate tampering because traditional prints can be easily removed by the chemical solution such as solvent or nail remover. Thus unscrupulous distributors and proprietors could alter expiry dates by wiping them off, fooling consumers into buying foods that are out of dates. Even greater health risks are involved when deceptive labels hide the true origins or even dangerous substances.

Tampering with food labels is a growing problem in the Chinese mainland, according to Principal Investigator Professor Pei Li, affecting public health and consumer confidence.

Using the latest nanotechnology, the team was able to make ink formulations that are impervious to chemical alterations. Products that are essential to public health such as foods, drinks and medicines can now be protected. That will put people’s mind at ease.

The new ATE ink is also able to provide evidence of tampering with
double colour tracing marks. Under a conventional ink, there is a layer of tamper-evident substrates which leaves tracing marks when removal of the print is attempted. Tracing marks are irremovable, making it possible to track and trace the fraudulent item throughout the supply chain for anti-counterfeiting investigation.

Another approach to stop tampering, a nano-coating technology (ATE-cTP) has been developed, which can be coated onto a package to form an irremovable coating as an invisible shield against chemical removal, according to the research team, which comprised of specialists in nanotechnology and advanced polymer materials.

The team has always wanted to bring security printing to wider use and make a true difference. The specialty inks can be applied by most continuous inkjet printers to plastic surface without any changes to the existing manufacturing process. They are ready to fit into any packaging needs and leaves good prints even on rugged surfaces. Moreover, its quick drying formula is suitable for high volume production. Manufacturers can now safeguard their products and their brands with ease.

The research was commissioned by a Hong Kong-based company, Hallyuen Holdings Ltd., which saw a pressing need for anti-fraud packaging. A number of companies from the dairy, beverage, food processing, electric cable, textile industries in Hong Kong and the Chinese mainland have already expressed their keen interest in using this indelible ink for printing on their products. Meanwhile, one of the largest dairy producers in China, China Mengniu Dairy, is currently using this novel printing technology for a variety of dairy products.

“We’re very excited to have demonstrated how innovative solution builds new anti-counterfeiting defences,” Professor Li said. The research is in line with an on-going effort at the Department of Applied Biology and Chemical Technology in protecting public health. A shining example should be the setting up of the Food Safety and Technology Research Centre, which provides frontline defence against dangerous foods through advanced food testing.