

Shedding Light On Counterfeiting

Toronto Company Uses Embedded Crystals to Foil Fraud

University of Toronto



Counterfeiting is as old as money itself. In the 6th century, a counterfeiter known as Alexander the Barber was so skilled at it that Emperor Justinian gave him a job in the government finance department.

Governments are unlikely to do that today. Instead, they turn to high-tech security firms staffed by engineers, scientists and other professionals dedicated to keeping paper currency and vital documents such as passports safe and secure.

“One such company is Opalux, a leader in the research, development and application of photonic color technology. Born more than a decade ago at the University of Toronto, Opalux has developed interactive security features that use light (photons) to deter counterfeiters and other fraudsters.

“These features are driven by ‘tunable’ photonic crystals” whose appearance changes—like a chameleon’s—“In response to a range of stimuli, including laser energy, pressure, electric current and chemicals,” said Opalux CEO

Andrew Binkley. For example, banknotes embedded with the crystals change colour when users squeeze or scratch them. On passports, the feature protects the holder's portrait with a colour-shifting image that makes tampering tough.

"We are the only people in the world who make this material," said Binkley. "It is so advanced that counterfeiters and competitors simply don't have the knowledge and resources to copy it."

The company spent 10 years perfecting the process.

"When I met them, they were doing fantastic research in the [university's] department of chemistry," said Pauline Walsh, an industrial technology advisor with the National Research Council. "The science created overwhelming opportunities."

Walsh helped Opalux turn its technology into marketable products and services.

The idea of specializing in sophisticated safeguards for currency and identity documents coalesced more recently. One hurdle: "Our key market is government, and it can be difficult for a young company to attract global government business," Binkley said.

Opalux got a big boost in 2018 when it received a federal contract from the Build in Canada Innovation Program. About the same time, it launched a next-generation security product in partnership with De La Rue, the world's largest commercial producer of banknotes and passports.

"Our business is based largely on trust," said Binkley, "so partnering with someone who has been operating for almost 200 years and can vouch for a small newcomer is a major coup."

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