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New paint promises high-speed Wi-Fi shielding

Wireless security in a tin of paint.

By Tom Jowitt, Techworld | Techworld
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IT managers should start familiarising themselves with a new security tool, the paint brush, as Japanese researchers have come up with a paint that they say will block high-speed wireless signals, giving businesses a cheap option to protect their wireless networks.

The problem of securing wireless networks has been an issue for a while now. Wi-Fi LANs with no encryption or running the obsolete WEP system, run the risk of having hackers outside the building eavesdrop on wireless LAN traffic, or simply stealing bandwidth. However, there are a number of solutions, besides encryption, for companies wishing to secure their networks.

For example, Meru Networks said last year that it was using Wi-Fi signals to "cloak" wireless LANs and make it impossible for hackers to decipher them outside the office building. Other methods include putting energy-efficient windows in buildings, physically blocking radio signals or even turning a building or office into a 'Faraday Cage' using mesh metal. However these options tend to be expensive.

But now, according to a report in the *New Scientist*, paint can be used to secure high-speed wireless networks. This is nothing new though, as RF-blocking paints have been available for a number of years now. Indeed, EM-SEC Technologies successfully tested its own RF-blocking paint back in March 2007 to shield wireless devices and other electronic equipment within a building.

But what the *New Scientist* is reporting is that existing technologies are becoming increasingly obsolete as companies are now using new, higher frequencies to send data. For example, the best wave absorbers commercially available today are only effective up to around 50GHz, whereas the latest wireless communications tend to use electromagnetic waves with a frequency of over 100GHz plus. The Japanese researchers say they now have a paint that can block the higher frequencies.

So how does this new blocking paint actually work? Well, electromagnetic (EM) waves can only be blocked when a material's magnetic field resonates at the same frequency as the wave. The *New Scientist* says that wave absorbers are usually made from iron-rich oxides, but higher-frequency transmissions outstrip the power of iron to absorb electromagnetic waves. This is because the standard oxide coating has a maximum resonance frequency that is outstripped at 48GHz.

But Shin-ichi Ohkoshi's team at the University of Tokyo in Japan has now identified a new aluminium-iron oxide able to block waves with a frequency almost four times higher. They used a sensitive magnetometer (a scientific instrument used to measure the strength and/or direction of a magnetic field) to confirm that a powder of the new oxide can absorb EM waves of up to 182GHz at room temperature.

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According to the researchers, the composition of the new material somehow distorts the bonds between iron and oxygen from their usual shape, which they believe explains the material's magnetic properties. They feel that further study, would lead to identifying new metal oxides that can absorb EM waves at even higher frequencies.

And it seems that the cost of this paint will not stretch IT budgets, as aluminium and iron are abundant materials and therefore the paint will be cheap to make.

"We collaborated with DOWA Electronics, a Japanese industrial company [to make a 100-kilogram sample order]," Ohkoshi is reported as saying. "The manufacturing cost is very cheap, around £10 ($14) per kg."

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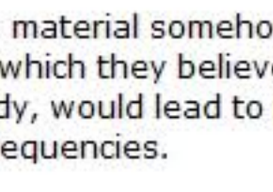

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