RISE TO THE CHALLENGE: KODAK AND PURTHREAD

Fresh out of bankruptcy, the photographic specialist is developing a new future: supplying its antimicrobial expertise to Purthread to make 'odour-free' garments.

Kodak's new moment

It was one of the most dramatic corporate demises in recent history: from virtually monopolising the camera and film market for the best part of the 20th century, and employing 145,000 worldwide at its peak in the 1980s, photographic specialist Kodak Eastman fell into bankruptcy in 2012 after a series of what have been described as 'blunders'. The US company has been accused of failing to predict how digital photography would revolutionise the industry – despite being the one to invent it in 1975. Japanese rival Fuji arrived on the scene in the mid-1970s, significantly undercutting Kodak's prices in camera film. Downward spiralling profits were compounded by the 2008 recession: revenue dropped from $13.3 billion in 2003 to $6 billion in 2011 and the group was forced to file for insolvency.

But it is far from defeated. The Kodak that emerged from Chapter 11 in August 2013 is "a very different company than the one in popular imagination, and very different to the one that filed for bankruptcy", said its lawyer Andrew Dietderich in seeking approval for its exit plan. More than 1,000 patents went on the chopping block and staff numbers trimmed to a mere 8,500. The streamlined group is now concentrating on high-end digital, packaging, inkjet printers and photobooths. But another area is stealthily emerging: a foray into the world of textiles.

"Photography seems a long way from textiles but in electrophotography we were incorporating antimicrobials into toners for printers and we realised very quickly that the successful incorporation into these types of materials, which tend to be polyester based, was very akin to the textile industry," says Tomas McHugh, general manager of Kodak's extended materials business.

It announced a partnership with North



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Carolina-based medical textile maker Purthread in October last year, in a deal to exclusively supply its antimicrobial technology, which will be embedded into yarns and spun into textiles. Purthread has been active in the medical sector since 2008, producing textiles for lab coats, privacy curtains and bedding and has recently made a move into textiles for sportswear, launching a collection of 'odour-free' garments.

"We started getting requests for clothing because people are so focused on cleanliness at the moment," explains Purthread CEO Lisa Grimes. "With the media attention on germs, for instance recently in football [the potentially deadly bacteria MRSA has been found in National Football League locker rooms] and across a lot of contact sports – it's a logical extension."

Potent antimicrobial

Silver has long been known as a potent, naturally occurring antimicrobial and is increasingly being used by textile companies and demanded by brands to help eliminate the odour caused when sweat breaks down. The hydroxyl radicals attack microorganisms along several pathways – degrading the cell's protective bio film, rupturing the cellular membrane and disrupting the biological processes within the cell. Because the agent bonds with the fabric in its raw state, the agent's efficacy can withstand repeated laundering.

"It's part of the actual yarn so we don't have to worry about leaching out because it is fully integrated, it's not sprayed or painted on or dipped," says Ms Grimes. "This allows it to last the lifetime of the product."

While Kodak has been working with silver for more than 100 years, and as an antimicrobial since 2003, the technology behind the application is relatively new. "We produced a topical antimicrobial that was later sold as part of a downsizing of that area. But what we did keep was this particular technology," says Mr McHugh.

Kodak had been working on the technology behind the scenes for a couple of years but kept it quiet while a number of supporting patents in the printing area were approved. "We've always known about the antimicrobial properties of silver but it was something that we then decided to pursue because of the new technology we had, with our printers able to coat surfaces with many different types of substrates and therefore take advantage of that antimicrobial property."

As one of the largest users of silver outside the jewellery industry, Kodak has a ready-made infrastructure. The silver is precipitated with various salts to provide the antimicrobial species. The product is 98.5% silver sulphate powder; the remainder is made up of reactants that provide discolouration protection.



Purthread has launched a sportswear collection including golf shirts, and which will be expanded to include base layers and socks.

Purthread

Purthread's lab tests showed the technology was efficient against gram-negative and gram-positive bacteria and Kodak thinks there is a possibility for tuneability – making the technology effective against certain species – with further testing. Tests show there is a significant reduction of bioburden after 15 minutes but Ms Grimes points out that the company doesn't claim healthcare benefits – although it is investing in cutting-edge technology to explore those – but can say that Purthread textiles are protected against odour and degredation. She adds that when tested in the field, people have worn tops for 20 days without detecting an odour.

Nano controversy

One of the hot topics in silver antimicrobial technology in recent years has been the safety – or potential lack of – concerning nanoparticles. Some claim too little is known about the effect on the digestive tract and lungs if ingested through the skin; others that washing treated textiles releases amounts of the nanosilver into the laundry discharge water, which can reach natural waterways and potentially poison aquatic organisms.

The silver used by Purthread is not in the nano range – it is an order of magnitude away in the micron range – but Kodak does work in the nano range for its ink jet printers. For that reason it is part of Silver Task Force North America, a group of 35 companies that work with silver antimicrobials, and recently supplied the US's Environmental Protection Agency (EPA) with data concerning particle size.

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"If you look at chemistry in general there are an awful lot of people looking at nano materials for various applications," says Mr McHugh, "but in the antimicrobial area we're in the micron range, the reason being that it's big enough to be close enough to the edge of the material to have the efficacy, and it doesn't fracture or distort any of the filaments."

One of the reasons Purthread was attracted to Kodak, as well as its vast experience in using silver, was that its antimicrobial technologies had already been through EPA approval. "They bring a tremendous amount of expertise into silver research and they saw what we were wanting to do in the textile field and that it was a good product extension and use for the silver salt," says Ms Grimes.

In October, Purthread completed registration with bluesign, an international certification agency that audits the energy, water and chemical usage of its partners and encourages environmental improvement. "Making sure we do things in the right way is very important to us and includes working with partners that are focused on being environmentally safe as well," says Ms Grimes.

Both companies are still testing and improving the technology, particularly on the public health [medical] side – hoping to take the efficacy to the sort of levels that will be beneficial in the hospital environment to combat hospital-acquired infections.

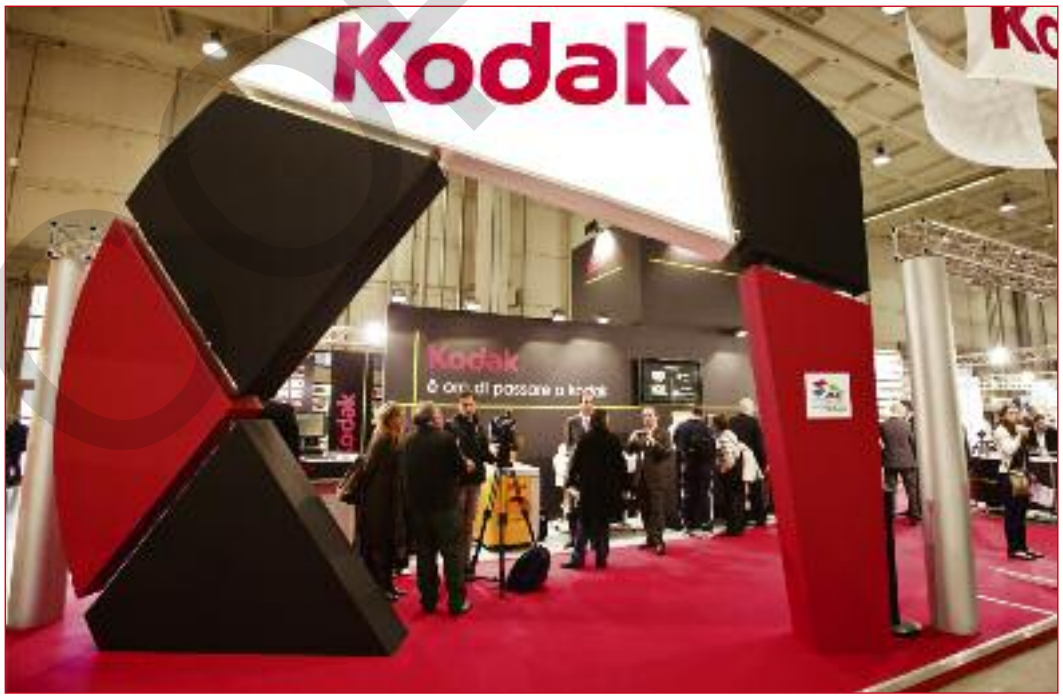
In terms of sports and outdoorwear, Purthread has begun to test natural fibres such as wool, which are showing "promising results". "We get beautiful colours in our textiles – there isn't any difference in the way the fabric looks or feels. That's something our laboratories and partners have been working on to get us to that point," adds Ms Grimes.



Purthread's CEO Lisa Grimes joined in July 2013 to guide the company through a new phase of growth.

Purthread

With discussions under way with several "big players" in the sportswear industry, some of whom are testing the yarn with their own products, Ms Grimes hopes to be able to make collaboration announcements early in 2014. For Kodak, those discussions are equally important as its forges into fresh territories. The Kodak of old played a major part in the sports industry, with every event captured on Kodak film. The new iteration looks set to contribute but in an entirely different way; embedded in the action itself.



Known worldwide as a photography specialist, Kodak is applying its expertise to new areas.

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