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Each month, CEO Europe shares its expertise and presents you an expert synopsis of a specific topic.

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Nanoworld4u

Emerging technologies are changing food processes

You may have already heard of RFID (radio frequency identification) where tiny tags and sensors monitor everything from quality control, access points, fridge-stock rotation to laundry ID, asset location and fire / flood prevention. As infrastructure technologies overlap RF will converge with wireless broadband, which will embrace nano technologies. Collectively these technologies will transform every area of our lives and may solve many of our world's major challenges.

Nano-scale technologies are amazing. The easiest way to appreciate the nano scale is to imagine the size of our world compared to a walnut. A human hair is 100,000 nanometers wide. A nanometer is one-billionth of a meter. It's not easy for us humans to focus on building blocks that measure 20 /50 nano-levels+

At this scale scientists and engineers can create new products not found in nature which behave (quantumatically, electro-conductively, mechanically) much different and stronger to that experienced in our conscious world.

According to the Royal Society, nanotechnology is "the design, characterisation, production and application of structures, devices and systems by controlling shape and size at nanometre scale." The technology is no longer a concept for academic discussion.

The food industry is investing billions in nano research. New foods that taste better, have less negative effects, or make you healthier, are sought. Already we have Canola oils that stop cholesterol entering the blood stream. But it is not food *per se* that is being transformed by nanotechnologies, but the whole infrastructure around food from farm to fork to make processes safer, more economic and Green.

Numerous products are available that will transform the way we clean our buildings, sanitize our work areas, protect our environment and help save energy. In fact, some of these products sound almost too good to be true. Take Nanopool, nano-engineered fluids for example.

Known as SPP's, (Surface Protection Products) these remarkable nanoparticles have the capacity to literally transform the way we clean, manage and protect our environment. Our food surface worktops, floors, fridges and homes, public toilets, footpaths, etc., will be safer and cleaner with robust protection, longer shelf life and easier to manage. Cleaning cycles can be reduced by 30%-40%.

A single brick can absorb a liter of rain water, but a simple nano-coating renders it waterproof, yet breathable, thus making homes and corporate property much more energy efficient. Footpaths that are waterproof are dryer and safer. And as H2O is now a scarce commodity that is good news for pond life as well as everything else that depends on water.

Environmentally, aggressive cleaning chemicals can be replaced with more gentle products. Billions of liters of noxious chemicals can be removed from our sewerage networks, removing costs and creating a better world for all living creatures.

Nano treatments have been created in order to satisfy the strict demand for self cleaning and easy clean food surfaces and utensils which possess background bacteria-static effects. It may sound as though it is too good to be true but extensive independent testing confirms the exceptional characteristics of the products.



Nano technology allows the engineering of nano scale particles and coatings that can bring massive benefits to Society and will catalyse innovation in healthcare and industry. Already widely deployed in drug development, cosmetics, communication technologies, landfill site decontamination / restoration, medical devices, auto paints, nano technology has led to the creation of the successful breast cancer antibody Herceptin, and the anti-leukaemia drug Mylotarg.

Central to one of the most effective forms of nano technology is the Sol Gel process. (This is the process which is used by Nanopool) This process, which was established more than 50 years ago, has recently been refined by German research engineers, with the result that they can now consistently manufacture SiO₂ (liquid glass).

This glass, which is particle free, can be applied to any surface thus creating a nano layer of super-phobic protection which rejects soiling of any form. Not only does this invisible super durable, flexible yet breathable nano coating protect against soiling, abrasion, acids, alkalis, UV rays, solvents and massive temperature fluctuations but it can be laced with anti-bacterial components which remain active for the life of the coating-up to 10 years.

So why are these products of specific interest to the food industry?

As mentioned, these coatings can be applied to almost any surface including skin, with the implication that all surfaces within a facility can be 'nanoed' with great ease and at very low cost.

Wash basins, mirrors, toilets, door handles, taps, shower curtains, baths, catering extraction filters, work surfaces, cookers, hobs etc. can be treated with a simple wipe or spray in a matter of seconds creating washroom areas which will be bacteria free for at least 6 months. Once treated with this food safe coating, surfaces can be cleaned very easily as the soiling agents will not have adhered to the surface.

Within food processing plants this Nano surface protection can be extremely useful. Meat Processing plants, like Kermene in France (that can process 1000 pigs per hour) in addition to other meat can easily remove the heavy, gluey fat residue from tools, knives, suspended chain-saws, employee protective wire aprons and assembly belts that currently require countless hours of chemical exposure to render clean and sterile.

Everything from food assembly lines to catering utensils can be "nanoed" in seconds, and for just a few pence, as one liter of Nanopool treatment will cover 300m² of glass or plastic. Previously, molded anti bac sinks units cost hundreds of pounds and door handles cost £20-£30.

Additionally, the environmental benefits are enormously positive as in most instances the treated surfaces can be cleaned without the use of detergents or other cleaning products. A simple swish of water or a rub of an NP micro-fiber cloth will suffice. There is also stone treatment which creates a stain proof and anti bacterial covering for tiled or stone surfaces and Oven Treatment which is effective up to 450 C. All of the Nanopool treatments can be applied with great ease at the production or post production stage. Significantly the products are environmentally benign. Soon we will be nanoing every surface in the home, the workplace and public leisure facilities.

Nano no-nos

As can be imagined, the interest in these products is enormous – but first a word of caution. As with all new technologies there are many charlatans who are all too keen to capitalise on the 'Nano' concept. Sadly, some organisations within the UK are already marketing products which are presented as being true nano products when quite clearly they are not. How do they manage this? Quite simply really. Water, (H₂O) could be described as a nano product.

To avoid being part of 'the great nano rip off' ask your supplier for proof that the products are nano engineered.

Having recognised this caveat we should be keen to embrace this new technology as the benefits are enormous. Not only have sales contracts for nano products in Germany already

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reached over the 10 million € mark, but nano products are now on sale in German supermarkets.

'It seems 2007 is the year of the nano revolution.

With more information and communication hopefully the public will be better informed about nano products. GM Foods were introduced into Europe without discussion and hence a very negative public reaction ensued. Nano offers major benefits in medical advancement, cost savings and productivity. We need to utilize to the maximum the enormous value for the environment implicit in nano products, whilst keeping our mind open to any negative impacts from adding nano *to* food, or animal feed. At least from the surface protection perspective, NanoPool products carries low risk and deliver compelling value to all stakeholders including The Environment.

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