

## Consumer Goods Rewrite

### **-Mini-introduction**

The first thing we need when learning about this subject is to know what nanotechnology is all about. Nanotechnology is a technology based on the nanoscale. Scientists are able to construct things from the ground up, by organizing atoms together one by one, until a larger object is made. Scientists need to be careful about how often, and where they use this technology however, as it is not a fully tested, and trusted technology. Though, it sounds like working with particles on the nanoscale is a little far fetched, and sounds years away, it is already in use in some common products today. Current surveys suggest that a large group of the general public did not even realize this. Some people say this is because the scientists are trying to keep the public unaware, and only want to introduce the technology if there are problems later on down the road.

### **-Why should the audience care and why did we choose this subgroup?**

The question arises, why should anyone care about this new technology? There are a number of reasons why the general public should want to know and get involved in this area. First of all, the federal government is spending a lot and plans on continuing to spend more money for the research and development in this area. President Bush has said, "I propose to double the federal commitment to the most critical basic research programs in the physical sciences over the next 10 years. This funding will support the work of America's most creative minds as they explore promising areas such as nanotechnology, supercomputing, and alternative energy sources."<sup>1</sup> The second reason and most important is that this technology already surrounds the public, and according to the Woodrow Wilson Report, 54% of the public knows nothing about nanotechnology. On the internet, there are sites that contain the pros of this technology saying that this could be the next big thing and how it can make many aspects of living better. Then there are also sites that share this could lead to massive destruction and leave mankind worse off than they are now. The general public should be introduced to this new technology and be able to learn the basics about it especially since it surrounds them within the current consumer goods.

### **-What are we going to tell them?**

This short paper is aimed at trying to get the reader more familiar with nanotechnology, and its use today, for the future, and some issues that come up when dealing with particles on the nanoscale.

### **-Tell them who the key players are, what the applications are, how they are used, and the when this is taking place (timeline)**

To begin, there are already many products on the market that are utilizing nanotechnology in their products. The technology is being used in all fields; however the focus here is on nanotechnology in the field of consumer goods. For the sports person, the technology is being utilized in tennis balls that bounce higher, and in the strings on a tennis racket to make the racket stronger, golf balls can fly farther and straighter. A nano ski wax that is applied easier and smoothes the surface better. Also, some bowling balls

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<sup>1</sup> <http://nanotechwire.com/news.asp?nid=2883>

utilize the technology to make them harder<sup>2</sup>. These products all allow each person in that sport that is competing to make the game more competitive.

For an average consumer, the technology is being utilized in areas such as adhesive bandages, where silver nano-particles mixed in the dressing area help to heal the wound faster. Drug delivery patches also utilize this technology, where nano-sized medicine particles are absorbed through the skin<sup>3</sup>. Cosmetic products are in the market, such as anti-aging creams, sunscreen, and general makeup also use nano-particles in their products<sup>4</sup>. Products arranging from harder, more durable plastics to stain repellent clothes, to self-cleaning bathrooms are all utilizing this technology. Nano-particles in the plastics can be used for enhanced durability are being used in car manufacturing. One known application is the step assists on vans and trucks<sup>5</sup>. The plastic incorporates the technology and makes the plastic more durable, and less prone to crack or break. Another plastic application is that of a “smart bag”. Similar to a plastic storage bag, the plastic will contain a section of nano-particles that will be able to sense if the food kept inside is still fresh or not. If the food is going bad, the toxins/ bacteria that start to build in the bag will interact with the surface, and change the color on a part of the bag to show the food is going bad<sup>6</sup>.

One product that is interesting is still in the research process, but it is the self cleaning bathroom. Basically, the nano-particles are put on the surface of the walls, and under a certain UV wavelength frequency, the particles go active, and break down organic compounds and kill microbes, with even more cleaning effectiveness than bleach. Another benefit that results from the coating is that since the particles are so small, it causes no water to be able to stick to the surface, so the wall stays clean<sup>7</sup>. Stain free pants also utilize nano-sized fibers and particles to keep the pants free from staining. There are also socks in the creation stage that contain small silver particles, to keep the foot smelling fresh all day.

Three major companies that have that have entered the nanotechnology field are AquaNova, Authentix, and GM. AquaNova is a company that “specialises in the development and production of clear, stable, water-free solubilisates of particles with a micelle structure for further processing in cosmetics, skin care products, pharmaceuticals, foodstuffs and nutritional supplements.”<sup>8</sup> The company Authentix “has developed authentication solutions for brand protection and fiscal recovery. Invisible, nano sized identification tags are added to products and then, using special equipment, field testers can immediately spot the pristine from the fakes.”<sup>9</sup> The third company, GM “is expanding its use of new materials, such as nanocomposites, to reduce weight in the vehicle while at the same time providing a quality, recyclable and affordable product.”<sup>10</sup> These are only three of the keyplayers, but there are more companies getting involved.

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<sup>2</sup> [www.nnin.org](http://www.nnin.org)

<sup>3</sup> [www.managedcaremag.com](http://www.managedcaremag.com)

<sup>4</sup> <http://www.cosmeticsdesign.com>

<sup>5</sup> [www.azonano.com](http://www.azonano.com)

<sup>6</sup> <http://fda.gov>

<sup>7</sup> [www.physorg.com](http://www.physorg.com)

<sup>8</sup> [http://www.nanovip.com/directory/Products\\_and\\_applications/index.php](http://www.nanovip.com/directory/Products_and_applications/index.php)

<sup>9</sup> [http://www.nanovip.com/directory/Products\\_and\\_applications/index.php](http://www.nanovip.com/directory/Products_and_applications/index.php)

<sup>10</sup> [http://www.nanovip.com/directory/Products\\_and\\_applications/index.php](http://www.nanovip.com/directory/Products_and_applications/index.php)

## **-Implications of what we told**

As nanotechnology surrounds the public more and more, there is and will be definite benefits. For example, better and longer lasting products, but there will also be risks to the people who use them. According to an article in the *Journal of Nanobiotechnology* there are potential known and unknown risks that can affect our body due to nanoparticles. According to the literature, it is possible that nanoparticles can enter our body through our lungs or our intestinal tract. Based on the different sizes of the nanoparticles, it can also enter the body through the skin, although there is no concrete evidence of this yet. Therefore, although we can assess the potential risks, there are areas that remain grey. Industry experts believe that tests that are set up to check the safety of current materials and particles can also be used. But if these tests fail, then we must look at other possibilities and regulations.<sup>11</sup>

Not only will this new technology affect the health of the general public, but there might be social implications that will affect the daily worker. According to the National Nanotechnology Initiative, development of nanoparticles and the technology could create possibly 2 million new jobs.<sup>12</sup> But the questions remains, what kinds of jobs are these? Do they require a specific knowledge and skill? It seems that with the growing number of opportunities there is a population that might be overlooked. With the enhancement of technology, the impacts are enhanced and broadened also. Our country especially faces a social problem that has been termed “the Digital Divide”, with new technologies, growing faster than we can understand them, it is quite possible that the people on the “other side” of the Digital Divide, those not tech-savvy, will be left far behind. What possible issues could this raise? Possible decrease in immigration, higher unemployment, decreased job opportunities, are we the new Third World?

Nanotechnology brings with it all of the concerns above and it is for this reason that it is important that besides the businesses, the scientists and lawyers being concerned, such an effort should also be made to create awareness with the general public. We must take action, whether the tool is an interactive website for young adults and those that are Internet friendly, or to create tutorial-type forums that directly contact those who are already behind in technology, we have to do something to help our public keep up with the acceleration of technology.

## **-Closing**

Regardless if nanotechnology will help the economy, or hurt the economy, the biggest issue is if it is safe or not. This is a big issue, and researchers most likely will not tell us the risks or dangers of it. Take for example, the nano-coated bathrooms. The consumer will be exposed to those coatings during their everyday lives. How well are those particles attached to that wall? What if when removing the tiles, and/or cutting the bathroom tiles the coating goes into the air with the dust particles, and they breathe in the

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<sup>11</sup> Nanoparticles – known and unknown health risks  
Peter HM Hoet, Irene Brüske-Hohlfeld and Oleg V Salata  
*Journal of Nanobiotechnology* 2004, 2:12 doi:10.1186/1477-3155-2-12

<sup>12</sup> The next big thing (is practically invisible) ; Nanoparticles - objects on a scale of one-billionth of a meter - now turn up in everyday products from tennis balls to sunscreen.  
Kelly Hearn Special to The Christian Science Monitor. *Christian Science Monitor* Boston, Mass.:Mar 24, 2003. p. 17

coating? These are some of the issues presently under attack. Some British researchers are strongly warning the public that they do not know exactly what happens with particles at the nano-scale, and that we must learn that many properties of materials change, and what is harmless at the macro-scale, could be harmful at the nano-scale. This is also why many people also worry about the cosmetics at the nano-scale. What can happen if too many of these particles absorb deep into your skin? The general public probably will not be able to rely completely on the government regulations, however each organization needs to think about the effects as well as the consumer needs to be aware of these issues, and take actions accordingly. It is just like the asbestos problem. Some brake pads currently still have some asbestos in them, and if the mechanics are not taught about the precautions of how not to blow brake dust around, and wear a mask, etc. It will keep it safer for the mechanic. As long as the public is made aware of what could happen, and what precautions to take, it could lead to something that can revolutionize the world as we see it today.

All in all, there are many uses for nanotechnology in consumer goods. However, the public should be made aware of the risks that we enter when working with these particles at the nano-scale. The new products can offer a lot more than what some previous products have to offer, and if used correctly, and people are educated about the technology more, it will be a great leap toward the future.