

# Nano products in everyday use

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Nanotechnology involves the precise control of very small structures on the nanometer scale, using a wide variety of methods and approaches. Vital areas of nanotechnology include the development of processes for the analysis of nanostructures, new techniques for structuring surfaces, the creation of so-called nanocomposites and related applications, the development of nanoelectronics, and the manufacture and use of nanomaterials. In many studies, nanotechnology has been hailed as the key technology of the 21st century and attributed with huge potential for transforming the economy and the employment market. A recent study published by the German Federal Ministry of Education and Research, for instance, estimates that somewhere between 50,000 and 100,000 jobs in Germany, provided by 450 companies and research institutes, are directly or indirectly dependent on nanotechnology. It is expected that many more jobs will be created in innovative sectors related to nanotechnology over the coming years.

## Products with improved or revolutionary new properties

Given the wide range of possible applications for nanotechnology, Degussa too sees great economic potential in this new technology in its own field as a global leading manufacturer of specialty chemicals. It is Degussa's view that innovation and the use of new technologies are essential ingredients in the promotion of sustainable development. Degussa makes use of nanotechnology as a means of conferring improved or revolutionary new properties on consumer products. Take lithium-ion batteries for example, where nanotechnology enables the company to produce ceramic membranes that are also flexible. As a result, it has become possible to make large lithium-ion batteries, similar to

those already employed in small electrical devices like cell phones, and use them as safe, environment-friendly power supplies in hybrid electric cars. Such batteries can reduce fuel consumption by up to 25 percent. Finely dispersed particles of titanium dioxide are another example: These are used in transparent sun lotions offering a high UV screening factor, thus providing sensitive skin types with reliable protection against damaging UV radiation.

## First "Nanotronics" science-to-business center in Marl

Further examples include car tires that help to save fuel, scratchproof paints, and high-performance computers. Modern society would be almost inconceivable without "nano". Degussa has been gathering experience with nanomaterials for many decades. The use of innovative or improved processes in conjunction with new analytical methods enables us to work with ever-greater precision in the nano dimension.

At its ultramodern Nanotronics science-to-business center in Marl, Degussa is also working on the development of new electronic systems such as radio-frequency ID tags and solar cells, where the product's functions rely to a considerable extent on tailor-made nanomaterials.

As users of nanotechnology, we take our responsibilities seriously with regard to human health and the environment. For this reason, our technology development work is accompanied by intensive research on safety issues, backed by constant dialog with consumers, environmental protection groups and public authorities.