



Press release

Düsseldorf, September 14, 2007

Science Press Conference at Henkel

Henkel: Innovations are the key to sustainability

In a science press conference held at its Fritz Henkel House in Düsseldorf, Henkel offered insights into the excellent research results and attractive products that can grow out of a lively innovation culture. The examples presented were new research approaches in hair biology, functional genome research for laundry detergent enzymes using white biotechnology, computer-aided methods for product development, and crash-resistant adhesives and composite materials.

“Innovations are triggered by exploring new areas of thought. At Henkel, we have set ourselves the goal of identifying future wishes and needs before our customers are even aware of them. Our researchers and developers have the necessary creativity and expertise to turn this knowledge into innovative products,” said Prof. Dr. Ulrich Lehner, Chairman of the Management Board of Henkel KGaA. “A lively innovation culture is essential for business success.”

Lehner also stressed how important it is for Henkel to be part of a worldwide knowledge community: “The many different challenges posed by globalization can only be met through networked thinking on an interdisciplinary and international scale. In seeking new ideas and developing them further, we must reach beyond our own corporate horizons. In addition to generating knowledge in-house, our research and development strategy therefore also includes active cooperation with external partners. In a worldwide network we collaborate with more than 250 universities.” For Lehner, innovations are also the key to sustainability. The basis for sustainable brands and technologies – the Company’s contribution to society – has to be established early, directly at the research and development stage.

Dr. Wolfgang Gawrisch, Chief Technology Officer (CTO) Research/Technology at Henkel, additionally emphasized the vital role of cultural diversity and cross-fertilization between scientific domains as success factors. “We focus on those topics that offer our company the greatest innovation potential. We first gather marketing insights into the needs of consumers and of our customers in the retail trade, professional crafts, and industry. Then we identify the appropriate scientific input, which we obtain by cooperating with universities, large and small research companies and institutes, start-ups, and by collaborating with other companies on joint research and development projects.”

On the research level, the cross-disciplinary technologies of the future, such as advanced biosciences, were of crucial importance, asserted Gawrisch.



Gawrisch also cited employees as an added success factor: “Successful research and development depends entirely on the people behind the inventions. With their passion for new ideas and their expertise, our scientists and engineers help to establish the basis for future business success.”

As examples of successful research and development, Henkel presented projects covering four different topics:

The inside story: New ways of creating innovative products for hair

Since 2001, the hair biologists at Henkel have made pioneering achievements in hair research. They have successfully investigated the mechanisms that control hair growth, structure and aging processes at the molecular level in the living part of the hair, the hair follicle that is anchored in the scalp.

By using advanced bioscientific methods, the researchers have been able, among other things, to characterize the biological and chemical differences between young and old hair. Taking this a step further, the hair biologists developed three inter-related test systems allowing them to demonstrate in particular the action of substances on the hair root.

The core of the new test systems is a three-dimensional in-vitro model of the human hair follicle, which was developed jointly with leading international scientists. It consists of three cell types that occur in the hair follicle and are isolated from hairs and cultivated in test dishes. The characteristic feature of the hair follicle model is that, just as in nature, the individual cell types communicate with one another and can generate various factors, including the one that governs growth. This allows the Henkel specialists to test a large number of substances per year to determine their efficacy and to investigate in detail the biological processes taking place in the hair follicle.

As soon as the effect of a substance on the hair follicle model has been precisely characterized, it is verified through tests on natural hair follicles. To do this, Henkel conducts extensive studies in cooperation with independent test institutes and working with volunteer test persons. The experts can thus precisely observe the effects on the hair root and the hair itself.

Products that have been developed using these new findings include Activ Dr. Hoting and the Schwarzkopf Professional care line Bonacure Time Restore.

White biotechnology: Functional genome research for laundry detergent enzymes

The exceptional efficiency of modern laundry detergents such as Persil, Dixan, Le Chat und Wipp Express would be unthinkable without high-performance enzymes. These enzymes not only remove stains, but also make it possible to reduce the required detergent dosages while achieving excellent washing results even at low temperatures.

Henkel has years of experience in developing washing-active enzymes and produces some of the required enzymes itself using biotechnological methods in a joint venture which it set up together with the Sandoz company at a site in Kundl, Austria. These biotechnological methods rely on the action of microorganisms (bacteria) to produce the high-performance laundry detergent enzymes. Technically, the process used to cultivate the microorganisms is called fermentation, and the bacteria are referred to as production strains.

To optimize the production strains, the fermentation process and the enzymes, the scientists apply the latest findings from molecular genetics – the investigation of genes and the way they control biological processes within the microorganisms. Henkel has already participated for many years in corresponding competence networks supported by the German Federal Ministry of Education and Research (BMBF). One aim of these competence networks is to tap into the enormous potential offered by bacteria and utilize this for commercial purposes. For detailed evaluation of the data obtained, Henkel uses bioinformatic methods.

— One result of this research work is the electrical BioChip. This is a kind of sensor which makes it possible to analyze the state of the production strains at the genetic level. It has been successfully tested in the enzyme production facilities in Kundl. Using the electrical BioChip, the biotechnologists are now able, for the first time, to determine whether a running fermentation process is progressing as desired and to intervene with targeted corrective measures if any anomaly is detected. In the past, it was only possible to measure the rate of enzyme production and physical and chemical factors while the process was running, but there was no way of determining how the microorganisms reacted at the molecular level until the fermentation process was completed. This involved complex analyses, and the specialists often had to wait several days before obtaining the results.

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Paradigm shift: From laboratory computer to computer laboratory

Virtual experiments, artificial intelligence, neural networks – only a few years ago, these were tools that most scientists could only dream of. Today, however, they are well-established not only in universities but also in industrial research. Computer technologies have developed so fast that even a laptop can now deliver computing performance levels that would have required a room-filling supercomputer just twenty years ago. This opens up new opportunities for researchers: Before they embark on the first practical tests, they can run thousands of preliminary experiments on computers and filter out the most promising among them. At the practical stage they can then focus on those experiments with the greatest probability of success.

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One example of these computer-aided approaches, also known as in-silico methods, is filtering out chemicals that will probably be non-sensitizing. Together with scientists from Moscow State University in Russia, Henkel has developed a neural network that is capable of predicting whether or not cosmetic raw materials could have a skin sensitizing effect, simply by analyzing their chemical structure. This allows the product development and product safety specialists to concentrate at an early stage on the substances identified as being the most favorable, thus saving time, resources and development costs.

The computer-based prediction systems are also an important aid to Henkel and to the European Union in establishing alternative methods to animal testing.

Morphology control: Crash-resistant adhesives and composite materials

To produce an adhesive that not only bonds well, but also offers outstanding mechanical properties, the morphology – or internal structure – has to be just right. In designing crash-resistant adhesives for the automotive industry, Henkel scientists have developed technologies that make it possible to create complex polymer structures within the adhesives, resulting in a substantial increase in strength. The trick is to know exactly which morphology controls which mechanical property in the material, and which chemistry is required to create that particular morphology.

The new generation of crash-resistant structural adhesives displays exceptionally high thermal stability and has a crash resistance that is more than ten times higher than that of conventional reinforcing adhesives. Henkel markets these adhesives for car manufacturing as part of the Terokal product line under its Teroson umbrella brand.

But the new technology is not restricted to automotive applications alone. It is a platform technology that can also be transferred to other areas, such as modern lightweight materials for aircraft manufacturing.

For more than 130 years, Henkel has been a leader with brands and technologies that make people's lives easier, better and more beautiful. Henkel operates in three business areas – Home Care, Personal Care, and Adhesives Technologies – and ranks among the Fortune Global 500 companies. In fiscal 2006, Henkel generated sales of 12.740 billion euros and operating profit of 1,298 million euros. Our 52,000 employees worldwide are dedicated to fulfilling our corporate claim, "A Brand like a Friend," and ensuring that people in more than 125 countries can trust in brands and technologies from Henkel.

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