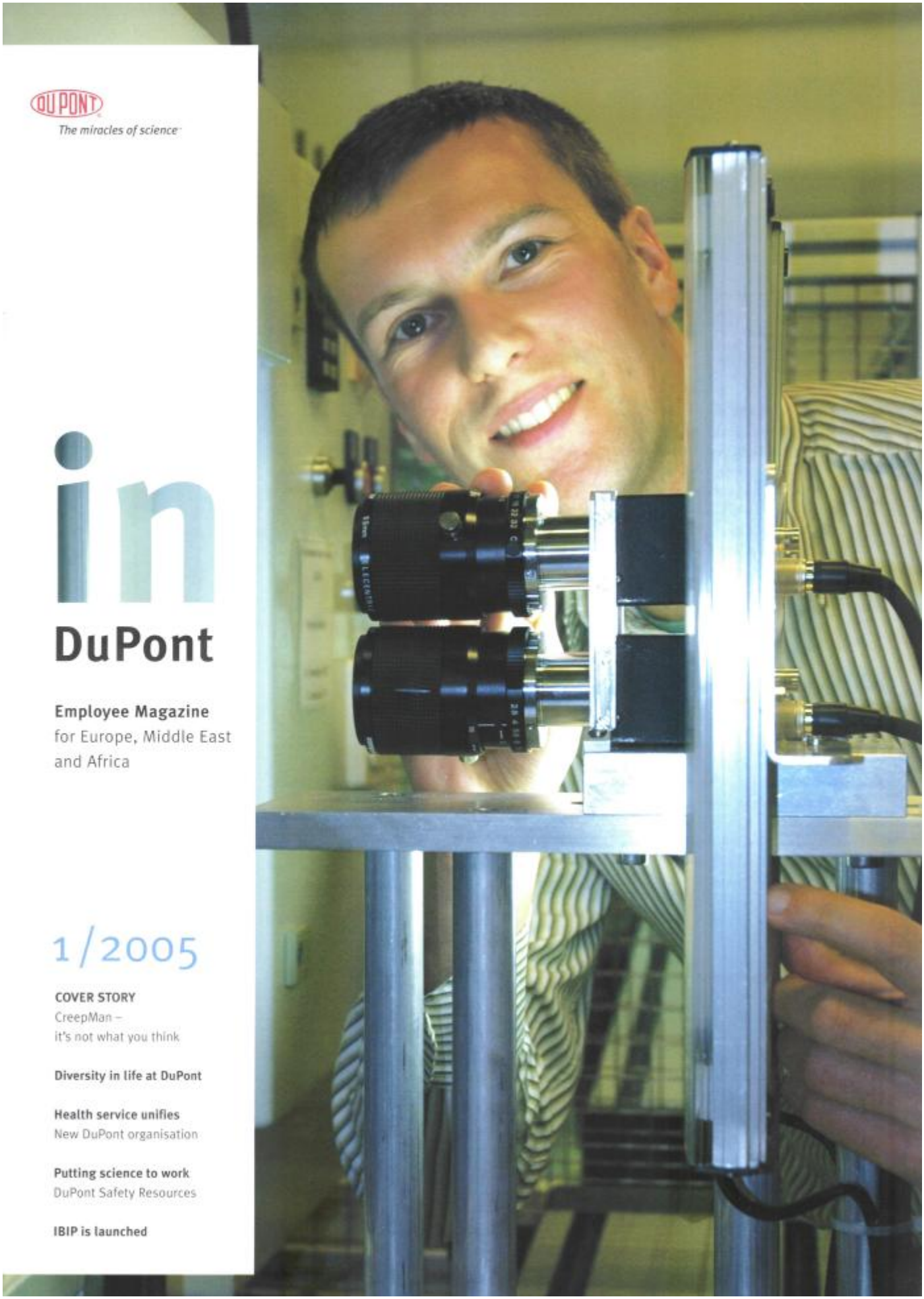

The miracles of science

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COVER STORY
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it's not what you think

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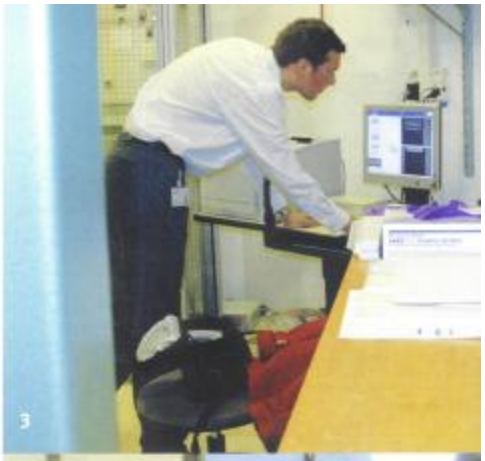
CreepMan – it's not what you think

Young intern develops unique machine to measure deformation under stress at the European Technical Center (ETC)

Have you noticed how some of your shelves sag under the weight of books, toys or the accumulation of DVDs? Apart from removing some of the things from the shelf, there is little you can do once the warp has begun. And you certainly don't want it to go on, as the shelf could eventually break. In the trade, this distortion is known as "deformation under stress" or "creep." To predict the long-term properties of shelving materials and similar products, and their resistance to stress, the DuPont European Technical Center (ETC) in Meyrin, Switzerland, has developed a machine it called CreepMan. The device uses specific technology developed in-house to measure creep for plastics and other high performance materials.

ETC, as the European Center of Excellence driving scientific innovation, fosters cutting-edge technology in response to market needs and requirements. With plastics replacing many metal items because they are lighter, it became strategically important for DuPont to prove that the new polymers offer the same resistance as metal. CreepMan provides data to qualify the high properties and performance of existing polymers, and can also demonstrate the value of new products such as long fibreglass.

Data on creep is particularly relevant in the automotive industry and industrial applications which together represent 75 per cent of Engineering Polymers' (EP) revenue. Up to 50 per cent of EP's market consists of providing plastics for applications that are under constant strain and as such directly concerned by creep properties (plastics, tubes, gears, etc.). It is estimated that CreepMan can provide data that will support product sales to the tune of $200-300 million.



1 Julien Lebranchu calibrating the camera to measure the creep on small plastic pieces put under different weight constraints

2 From left to right, the team involved in the CreepMan project: Daniel Ayglon, Julien Lebranchu and Alexandre Antonijevic.

The development project of a young engineer

"CreepMan was developed in a win-win scenario for DuPont and one of its interns," EP testing and analytical laboratory manager Daniel Ayglon reveals. About two and a half years ago, intern Julien Lebranchu decided to improve an existing creep machine as the final project for his engineering degree. With the assistance and input of the ETC mechanical department, Julien conceptualised and developed the new features that render CreepMan so remarkable: precision measurement, automation and software.

Today, the ETC is home to three CreepMan machines to ensure optimum measurement. Since parameters for measuring polymers' creep are stress, time and temperature, having three machines allows the centre to measure the performance results at different temperatures and compare them. The system's automatic parts are controlled by software that was also designed in-house and which delivers charts of the results.

Creep data eventually available for account managers on the network

Thanks to the software, creep data for the various polymers is available on the internal computer network to DuPont engineers. They can check performance under stress results from their desk at any time. Eventually, this data will also become available to other teams. It makes sense. If account managers for the automotive industry want to demonstrate the specific properties of one of the EP products to their clients, they could do so at the click of a button, anywhere in Europe.

Thanks to CreepMan, DuPont is able to generate its own data efficiently and can easily supply it to customers. As for Julien, DuPont hired him and he has embarked on other projects. So watch this space for more breakthrough technology in the future.

3 Julien examining creep data delivered by the in-house designed software

4 A view of the older creep measuring system that required a technician to measure the deformation with rudimentary lenses

From lenses to laser and finally to camera: measuring creep to the micron!

Creep has been measured for a long time. In the past, it was done with machines that required a technician to follow the creep deformation generated by weights with rudimentary lenses. The work was tedious and not very accurate. Later, a more sophisticated machine using a laser measuring device appeared on the market. Unfortunately, although the process was automated, the laser measurements were still not precise enough.

The ETC team has replaced the laser with cameras. Thanks to pattern matching technology, these cameras can recognise the unique mark applied to the analysed piece of polymer for instance. Cameras visualise the entire pattern of the mark, while lasers are only able to focus on one specific pixel and that could be a different one with each measurement. In other words, pattern matching analysis with cameras ensures greater accuracy and a much more representative measurement than laser technology can offer.

IBIP is launched

Improved Business Information Project

The dress rehearsal and opening performance have been and gone – to great acclaim. The star of the show was the new Improved Business Information Project (IBIP) system at its launch in Landshut, southern Germany. Landshut is the first site to go live with the new SAP R/3 – 4.6 after a two-year preparation and development phase. Before pushing the go button, the system had been fully vetted in a business simulation trial, planned by a small group of local experts and the project team in conjunction with participants, to make it as realistic as possible. "This simulation exercise is the final practical check before the system starts running in earnest," project leader Michael Wessel explained. "It also gives users the opportunity to test their newly acquired knowledge and skills." The practical exercise was the last phase of a four stage training programme for the introduction of IBIP at the different sites.

Curtains up at Landshut

Landshut, the first site to go live, tested eight important, mainly "end-to-end", processes. They included all supply chain processes, right through from customer orders to product delivery. Ten employees from production planning, production, research and quality assurance, customer service, purchasing, finance and the delivery depot took part. Some finance employees even came from Wuppertal and Cologne to join in.

The testing team sat at a "roundtable" so that everyone could follow the process through each step and immediately discuss and correct any errors. This approach also allowed them to gain a more in-depth understanding of the interplay between individual components of the SAP system. They were supported by Key Users from a variety of departments. Members of the Core Team in Wuppertal, as well as process managers and the business process owners (BPOs) were on hand to offer advice and assistance.

"If we were actors, we would judge the signs favourably. Typically, there are hiccups during the dress rehearsal," Werner Wagner, business manager of the Powder site in Landshut said. "In this case, a few glitches in the system still had to be ironed out." Furthermore, the practical trial showed that not all the parts of the totally new process were clearly understood. However, by the time of the Go Live, everyone had done their homework and the curtain could rise.

On 7 February the show was up and running and the system began working in earnest. Project team experts made sure they were on site to support employees during, and in the days and weeks after, the launch. Now that IBIP has demonstrated what it can do, other sites will soon follow suit.

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