

Knowledge-  
alliance  
Rhine-Waal

# Cross-border innovations



06 AUTHOR E-PHARMA



08 INCENTER



10 HME TISSUE TAPE



12 ABEL



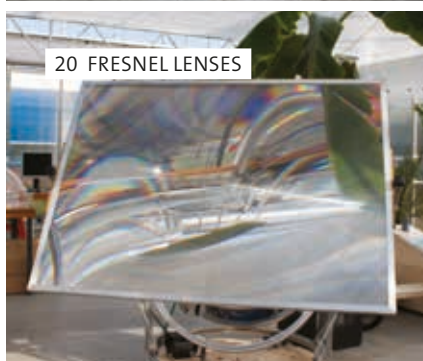
14 MINERALSIGNS



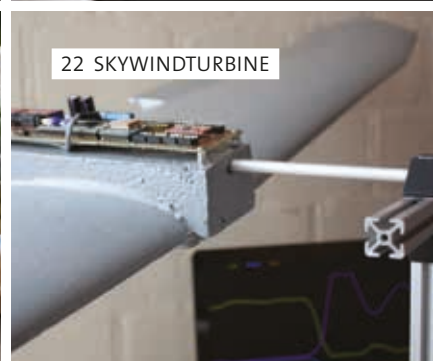
16 RESNAP



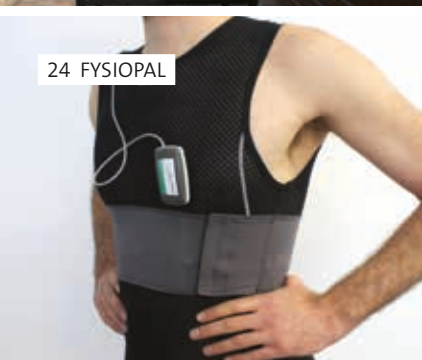
18 ECO-DRYER



20 FRESNEL LENSES



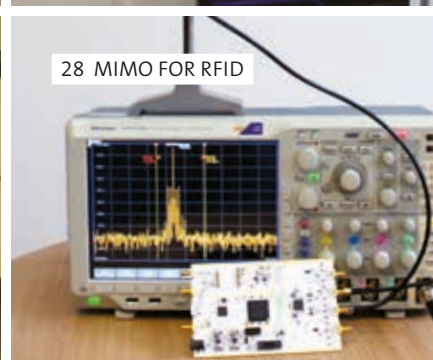
22 SKYWINDTURBINE



24 FYSIOPAL



26 FVISION



28 MIMO FOR RFID



30 ASK ALFRED



32 AUTOMATIC WATER ANALYSIS SYSTEMS



34 REDEFEM

## Preface

Dear Readers,

“After three years of the Knowledge Alliance Rhine-Waal, I can look back with pride on what has been achieved. In particular, I am thinking of the fifteen cross-border innovations which were supported and advanced by the Knowledge Alliance. Even though cross-border cooperation often involves additional hurdles to overcome, the innovations produced here are a good example of why it is worth the effort!

These are innovations from a range of different knowledge-intensive areas, all of which are part of a German-Dutch collaboration. As the project manager in charge, I frequently obtained good insight into just how much work and commitment the business owners and partner organisations put into their developments. Due to the technical nature of the innovations, they were often very time-intensive: hours of measuring, the use of complex specialist equipment and meticulous detailing of prototypes. A range of partners and experts from both countries was, therefore, urgently required to jointly develop an innovative, marketable product.

In closing, I would like to use this foreword to thank all those who are part of the Knowledge Alliance and who have made the Knowledge Alliance possible in the first place. Like every alliance, the Knowledge Alliance survives on partnerships, cooperation and

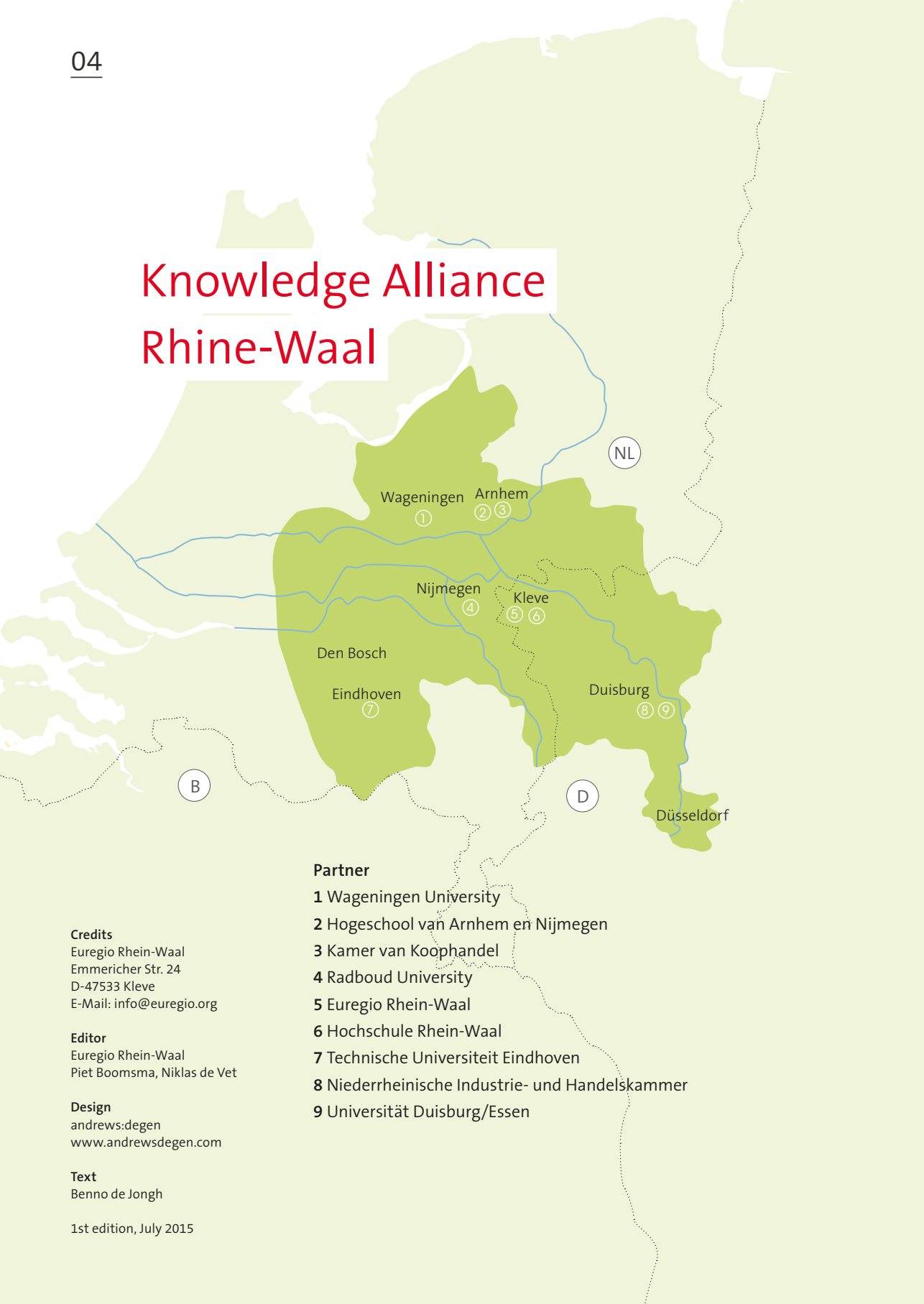


good collaboration. To quote Aristotle: “the whole is greater than the sum of its parts.”

I, therefore, invite you to dive in to the fifteen German-Dutch innovation projects, and I hope you enjoy reading about them.”

Piet Boomsma,  
projectmanager Knowledge  
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# Knowledge Alliance Rhine-Waal



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1st edition, July 2015

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- 7 Technische Universiteit Eindhoven
- 8 Niederrheinische Industrie- und Handelskammer
- 9 Universität Duisburg/Essen

The activities of the Knowledge Alliance Rhine-Waal are aimed in particular at new, research-intensive companies and entrepreneurial students. As part of the Interreg IV-A programme for Germany-the Netherlands, the Knowledge Alliance has had the opportunity to support fifteen innovative projects from new companies from the Euregio Rhine-Waal.

The fifteen projects presented in this brochure have all held their own in front of a jury of scientists, business developers, investors, companies and intellectual property specialists. These are innovations from a range of different knowledge-intensive areas, all of which are part of a cross-border German-Dutch collaboration. Some of the innovations have already found investors, others, due to the complex nature of the development, are still working on the technical details of their products and services and hope to soon make the final leap onto the market.

The range of innovative projects is huge: Audio-visual goggles for stress-free MRI scans, a device that continuously ensures the quality of water and a flying turbine that produces more wind energy than a wind turbine all received support. Likewise, an app that makes communication with sick children easier, an energy-saving tumble dryer and a personally configurable warning system for people in emergencies – just to mention some of the fifteen innovations.

The Knowledge Alliance Rhine-Waal looks back with pride on the past years and follows the development of the individual innovations with excitement. The Alliance is keen on continuing to make a contribution to the science-based economy and to support, guide and advance many other German-Dutch innovations.

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## The relevance of traceability

The laboratory – a place where precision  
is required at all times.

Who did what, and when? When were specific texts signed off on, and by whom? These are questions that may be a matter of life and death in pharmaceutical companies and large institutions such as hospitals. „Our German partner, Lims at Work GmbH, which is active in the pharmaceutical market in particular, noticed how its customers were struggling with this problem. Classic document management systems, which are commonly used, must fulfil all kinds of legal documentation obligations. That makes the whole thing particularly difficult.“

Egbert Heuvelman, director of Turpin Vision, explains how Author-e-Pharma can align the complicated processes in environments where texts and content are worked on in a very formal manner and make them considerably easier. „The processes are very demanding, and separate documents can be updated much more easily. The best example is Word files. It is important that information is traceable, even if the matter dates back a number of years.“

A market analysis was conducted in order to research the options. The product was translated into German, and as a result the doors to the German market are now open. Author-e-Pharma is already being used in a lab in Germany to compose formal documents. In addition, further investigations are carried out to see if Author-e can also be used for processing measurement results. „Both are a kind of spin-off of what we actually intended, but we view it as a good test. Now the real work begins, we’re sounding out whether major pharmaceutical companies are interested.“

“It’s important  
that information is easier  
to trace.”

Egbert Heuvelman

Everything began during a match meeting in Aachen, where Egbert Heuvelman met his current business partner, Georg Strömer. They discussed the many regulations for companies in the medical and pharmaceutical sectors. Strömer identified the application possibilities for his market and together they applied for a grant. „For this application, we decided to use the Author e-Pharma system ourselves, thereby merging form and content. The Knowledge Alliance financed courses on presentation and sales techniques for us. We are primarily attempting to grow through our own sales; in the meantime, we’re continuing to increase the market value of the product.“

Measurement brings clarity, and this also goes for small technical product parts. That's because if the smallest individual part doesn't fit, the final product won't work. However, how do you know whether these small components have the exact right dimensions? Ernst Treffers from Xpress Precision Engineering explains how he makes this precision work even more accurate along with his partners on the Incenter project. „We develop machines to measure products for quality control. A probe touches the products at various points and determines the dimensions of the product. This ensures that the dimensions correspond to the product specifications. A cylinder for a car, for example, must fit very accurately; otherwise, it won't work as well.

„The probe is best described as a pen or finger with a ball fitted to it, which is less than half a millimetre in length. In short, a very small and sensitive measuring instrument that determines the dimensions of even smaller components. Car cylinders are, therefore, not measured at the Incenter project. Treffers: „What's different is that we can measure very small products; products that are much smaller than a millimetre - and at an accuracy of a few millionths of a millimetre. You're probably aware that such individual parts are of great importance in many industries, and also that there are an increasing number of them. We measure e.g. components for hearing aids, gear wheels for watches and camera lenses for mobile phones. Even a minimal deviation has an impact on the final product.“

“Small individual components  
are of great importance”

Ernst Treffers

The products are used primarily in research, in national metrology institutes or in technical universities. „The Knowledge Alliance helped us with the development of the project with training courses and in the selection of suitable partners. We found these partners,“ explains Treffers. The German company is responsible for the industrial design, Traffitec from Goch helped with the construction of the electronics and NTS-Group from Wijchen took on the actual production of the probe. Treffers: „We don't currently need investors; we have our own cash flow. That could quickly change in the future. For example, if we want to further expand with our company, funding from investors will be essential. Incenter will be adapted to the needs of industry in the Netherlands, Germany and the rest of the world - everywhere where very small components need to be measured.“



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Meticulous  
measurements  
of great interest

The surgical adhesive tape that can stick intestines back together.

# Saving lives with adhesive tape

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Incisions to intestines are routine in almost all major hospitals. Without exception, these are difficult interventions with corresponding risks, sometimes persisting up to several days after the operation. There is a high risk that the intestine will leak after the operation. The patient then has to be operated on again, with the same risks of complications. In order to prevent this, GATT Technologies has developed a surgical adhesive - managing director Johan Bender describes it as „adhesive tape“. „Currently, intestines are frequently sealed with stitches, or sometimes with sprays or gels,“ explains Bender. „This has many disadvantages. We have developed an adhesive tape made from special polymers that adhere to the intestinal tissue and the adhesive tape itself. It is a major challenge, as the intestinal tissue is moist and the adhesive tape must stick to both moist and dry surfaces.“

The adhesive tape is sterile, transparent and available in all shapes and sizes. The product already exists and is currently being tested on animals. According to Bender, this phase is of great importance. „We are observing in test animals how the adhesive tape reacts in the body. In approximately eighteen months we will be testing on people. We must then find a large company that has links to surgeons in hospitals and can profitably place the product on the market.“

Bender is convinced that the GATT adhesive tape will ultimately be used in hospitals. „There is simply no other comparable product that prevents intestinal leakage. Follow-up operations or stays in intensive care are avoided. The adhesive tape, therefore, saves a lot of time and an average of €25,000 per patient. However, the most important thing is the health of the person,“ Bender stresses. „Because patients often have a poor – or literally no – quality of life if their intestines are leaking.“

Bender used the grant in particular to advance the production of the adhesive tape with the German partner Brabender who developed the manufacturing equipment for it. „If the tests for the product are completed with a positive outcome, production must immediately start at full speed. Since then, there has been intensive contact with the Knowledge Alliance every month to discuss matters such as a possible increase in the grant, the progress and planning for the project as well as assessing cash flows. It’s nice to have someone looking over your shoulder.“

---

“Adhesive tape saves time,  
money and lives.”

Johan Bender



The machine that produces the adhesive tape.

You are perhaps familiar with the big red alarm button that many older people have hanging around their necks. This literally allows them to seek help at the touch of a button, when the situation demands it. Joost van den Broek, managing director of Caveor, explains how his partner Thijs Sondag came to him with the idea of developing an improved version of the alarm button.

„Thijs’s grandmother had a button like this, but she never actually wore it, and when she did she hid it under her clothes. That’s understandable, because a big red button tends to stick out and be something of a stigma. So we thought: why not develop a pretty alarm button? And while we were at it, why not also develop an alarm system which makes use of the latest technological possibilities?“

Abel was born. They convinced designers to put the alarm button in a piece of jewellery: a chain that people will happily wear around their neck. „Abel is an aesthetic solution to a practical problem,“ says van den Broek of his project, emphasizing that Abel is more than just an appealing-looking button. „The traditional system worked through a telephone landline. We on the other hand have developed a system together with

engineering firm IMST GmbH in which the button is wirelessly coupled to your smartphone, tablet or router. By pressing the button, nursing staff or carers receive a message with the details of your location. Abel thus combines the advantages of traditional alarm systems with those of modern ones, through which an alarm message can be transmitted even outside the house.“

“An aesthetic solution  
to a practical problem”

Joost van den Broek

According to van den Broek, Abel is the first external button that can be easily integrated into an existing or new personal alarm service, which allows for a range of different applications. The range of Abel out in the open is 40 metres. The first interested parties have already been in touch. Following some tests, the first one hundred units of the product will be produced soon. „We are on the lookout for partners who want to work together with us to get Abel known in the Netherlands.“

In the meantime, jewellery designers are busy designing new models to match the lifestyle of as many users as possible. Abel is aimed at anyone who depends on help in emergency situations. It is, therefore, a large target group, consisting not only of the over-65s, but also children, people with disabilities and extreme athletes. „Tastes are varied. To make the whole thing more individual, the next step will be to allow people to design their own jewellery.“



The alarm button on the reverse side of the piece of jewellery.

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## The press of a pretty button

Invisible to others, but easy to find.  
The alarm button – at first glance nothing  
more than a pretty necklace.

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Waiting for a short moment  
until the other signs tell us  
where we need to go.

D  
015

*Wartebereich*

Simply finding  
new ways

You really only notice them when they give you no information, or the wrong information: signposts. They can be found in many buildings – signs that are supposed to direct visitors to the right department, the toilets or the car park. Around twenty per cent of the destinations in a large building move to different rooms every year, meaning the necessary adaptations must be made. Michael Göke explains how he's using the latest technology with his project Mineralsigns to make things as easy as possible for visitors and employees, for example in hospitals. „If the function of a department or a room changes, you often see an A4 sheet printed and quickly stuffed between two transparent panes. We have developed a sign made from a plastic that resembles marble, the contents, colour and size of which can be adjusted in next to no time. The Mineralsigns just have to be touched with a smartphone and the order for a new sign can be submitted using an online form, with the sign sent out within three days.“



The signs can be easily changed using a smartphone.

The marble-like plastic also has sustainable properties, according to Göke. „The signs can be recycled easily and converted to new items. If you send back the old panels, you'll also receive a discount.“ Göke is a trained industrial designer, as is obvious from the design of the Mineralsigns. „Practical solutions go hand in hand with an architectural approach - after all, the signs must match the building. There is no loss of colour thanks to the composition of the material. And with the aid of the latest printing processes, we can also supply signs in Braille.“

After a successful contract with a German hospital, large buildings in Benelux and Germany are also on the horizon as customers, according to Göke. „The grant was used for product development for a niche market, and it's hard to say how big it is exactly. In addition, the contacts with the Knowledge Alliance led to the organisation of workshops and the exchange of information. This meant I was able to get a bird's eye view of my own company and take a look and see what's working and what could be improved.“

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“Practical solutions  
go hand in hand  
with an architectural  
approach”

Michael Göke

Thousands of photos on your smartphone, hundreds on your laptop and countless more on your digital camera - and then friends come around, and you just want to show them your holiday pictures. In this mess of unsuccessful pictures and dream photos, you can't see the wood for the trees and would rather show your friends an old-fashioned photo album. That more or less is how the idea for



ReSnap came to Thomas Beguin. “It actually began with my own frustration. It was always a drama when you wanted to put together a photo album. So we thought: Why is it not possible to just do it through social media? We developed a system with algorithms that can find the best photos. It works for all photos stored on your computer or uploaded to social networks. In principle, the system mimics the brain when it puts a photo album together.”

According to Beguin, as well as keeping your fingers free of adhesive, there are other obvious advantages compared to a classic photo album. “You can put a photo album together in a minute, without having to do very much. It's possible to make preselections, but it's not absolutely necessary.”

---

“The system mimics the brain”

Thomas Beguin

Depending on the size, you'll get a digital and physical photo album for 25 to 35 euros. “There are also other options, such as creating simple captions. But generally the options should be as limited as possible, so the process remains simple and quick.”

Many people already have a ReSnap photo album. Beguin: “Last year we had approximately 50,000 users worldwide, the majority of them in the Netherlands. Germany is the next market we want to conquer, so we were looking for German partners who specialised in online marketing and strategy. That's how we came across Rheinschafe. It's not particularly smart to want to reinvent the wheel in this area. Therefore, we approached the Knowledge Alliance along with them and our idea.”

Meanwhile, ReSnap is being further developed. “The system is constantly learning from all the photo albums it creates. What photos do people like, and which ones don't they like? The feedback from our users is being actively processed. That's what really separates ReSnap from other comparable ideas.”

A modern, old-fashioned photo album.  
Keep memories forever, quickly and easily.



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Create a photo album  
in a few minutes

# Fresh wind in the tumble dryer



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Like many inventions, the idea came when it was least expected. It was a warm summer's day in the year 2008. André Koops sat in his garden and watched his wife hanging up the laundry. All of the laundry? No, not the hand towels, she put them in the tumble dryer. When he asked his wife why she was doing that, she answered: „They get nice and soft in the dryer.“ The plan for the Eco-Dryer was born: Why not bring the wind into the tumble dryer? Why should a tumble dryer heat the air, if it also worked with normal, non-heated air?

This anecdote comes from industrial designer Koen Koevoets. His business partner Koops asked him to design the dryer, which was when the real work began: Constant improvement of the new system. The two men built a prototype with the aid of a grant from the Knowledge Alliance Euregio Rhine-Waal. They researched the legislation and regulations and developed a measurement system that can prove that the Eco-Dryer works better than existing systems.

Koevoets: „This new drying technology can dry more economically, but it has other advantages: It can dry several different kinds of textiles at the same time. The Eco-Dryer also dries hypoallergenic because it can remove all dust particles. There is, therefore, only a small risk of allergic reactions.“ The project is more than cross-border in nature. „The German cooperation is indispensable“ says Koevoets. „Our partner MeasX is an

expert in the development of software for household appliances. Our neighbours also have a lot more knowledge in the area of household appliances. The big names, such as Siemens and Miele, are German. They are also our potential customers, with whom MeasX cooperates closely.

“First you develop a product,  
then the business”

Koen Koevoets

Koevoets is looking to the future with confidence, even if in his view it will probably take about a year before household appliance manufacturers actually implement the idea, as for example water pump dryers and gas dryers have only been on the market for a relatively short period. Flexibility is very important in new ideas because you never know exactly what's going to happen. First you develop a product, then the business. Then, the Eco-Dryer will hopefully find its way to consumers through the existing brands.

Whether it's a rear-view mirror in the car to reduce the dead angle, navigation lights on lighthouses or 3D televisions: the Fresnel lens has replaced the classic lens in many areas. This relatively new lens type provides a clear advantage compared to its thicker and older predecessor. The reduced material costs ensure that the Fresnel lens is easier and more cost-efficient to produce and lighter in terms of its weight. In addition, the advantage of the thin sawtooth structure is that the optical power loss due to absorption is lower, so that focusing the light in the desired shape is easier. Piet Sonneveld has developed an innovative production method for these lenses. The idea came to him on a visit to a factory in which solar panels were being produced with so-called CPV systems. With plastic Fresnel lenses, light can be concentrated on a small surface, meaning that less solar cell surface area is required and efficiency is increased.

Why not further improve this technology and look for other areas of application, thought Sonneveld. „Together with Peter van den Haspel, the owner of Fresnel-Linsen, I held an Elevator Pitch with the Knowledge Alliance. With the funding we received, we then developed the prototype.“ This required outside assistance, because for this type of new technology, precise calculations in every area are of critical importance. The Hochschule Rhein-Waal in Kleve and the British Institute of Engineering and Technology were responsible for the calculation of the lens design, the analysis of the mould quality and the testing of the first lenses produced. Polyoptics GmbH in Kleve provided its special laser telescope for further analysis of the prototype.

„The stated aim of International Fresnel Services is to start the commercialisation of the lens this year. The lenses are to be distributed through an online shop,“ explains Sonneveld. As well as sales to various branches of industry, Sonneveld and his business partner also had a range of specific applications in mind from an early stage. They have developed a system to concentrate solar energy for greenhouses, primarily designed for potted plants. „Potted plants don't like too much sun. Our Fresnel lens can concentrate light very effectively, and ensure that the plants spend most of the day in the shade.“

“Our Fresnel lens  
can concentrate light  
very effectively”

Piet Sonneveld

A completely different and more eccentric and idealistic area of application is represented by the Sunlight Cooker, according to Sonneveld. „That's a mobile cooker for sunny regions, particularly developing countries. A special Fresnel lens in the Sunlight Cooker captures light during the day. The device converts it into energy and the heat produced is stored in a heat tank, so that users can cook at any time. We believe that this device is particularly interesting for the African market, as people usually cook there in the evenings.“

The Sunlight Cooker.  
Cook anywhere, at any  
time, using the sun.

# Capture light, produce energy

Fresnel lenses  
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Energy high  
above the ground

At first sight, the draft drawing resembles a wind turbine. But when you look more closely, you immediately notice two major differences: instead of blades, there is a small aircraft that is not connected to the ground by an upright post, but is rather attached to a flexible cable. „Basically it’s a glider that moves like an aircraft in the air“, explains Jurian Rademaker, director of QConcepts. „The glider swoops and the propellers produce energy which is conducted to the ground through the cable.“

SkyWindTurbine, the latest project from QConcepts, is not just an alternative method of producing wind energy, according to Rademaker. „This system has many advantages in comparison to the classic wind turbines currently in use. We anticipate that we can fly the aircraft at a height of more than a hundred metres. This means energy can be easily obtained in areas that are relatively protected from the wind, and fewer materials are required in comparison to wind turbines. At these extreme heights, there are also fewer shadows cast along with the disfigurement of the landscape.“

Rademaker had the basic knowledge from professional sailing, in which he had worked among other places on the technical team for the Volvo Ocean Race, developing one of the regatta messengers. With SkyWindTurbine, he took advantage of his knowledge of materials and their best use. With the grant from the Knowledge Alliance he developed a proof of concept in conjunction with the Hogeschool Arnhem-Nijmegen. The German company Von der Linden supplied the composite material. „We didn’t seek out this partner because we needed a German partner for the grant, but because it is the most suitable partner in this field. Borders are for me like they are for the wind - I hardly notice them.“

—  
“Obtaining energy  
in wind protected areas”

Jurian Rademaker

A prototype will appear soon, which will be subjected to a first test. Rademaker first turned to dairy farmers. „They often have a lot of land, have a constant need for energy and are currently paying quite a lot for electricity. But a military camp abroad might also be considered. Our target group is really anyone who needs cheap and clean energy, at virtually any location.“

**In principle, office work is not dangerous, but sooner or later more than half of those working in an office will experience physical complaints. These are generally back, neck and shoulder pain, which can be very persistent and not infrequently lead to long-term absences for health reasons. Jasper Dijkman, managing director of Elitac, explains how his new project Fysiopal prevents these types of complaints. Elitac specialises in the design and development of smart suits, which can transmit information through vibrations in the fabric. Or as Dijkman puts it: „We make intelligent T-shirts which tell the wearer things they didn't know.“**

The start-up initiative previously developed a shirt that could transmit information to ground soldiers about their navigation direction. From military surroundings to focusing on a very different environment: the office. „The cause of pain in office work is almost always one's own behaviour, and almost never physical wear and tear,“ explains Dijkman. „Many workers sit for long periods in the same position, or in a bad one - or both. This includes a cramped sitting posture, e.g. hours in front of the computer with hunched-up shoulders. The T-shirt helps the wearer to sit in the correct posture themselves.“

It is not comparable to a kind of band that emits electrical impulses at intervals of a few minutes. Dijkman: „The wearer simply feels a correction now and then through a short vibration. Apart from that they don't need to think about the item of clothing at all. The shirt is worn under other clothing and is so thin it is almost invisible to others.“ But how does the shirt, designed by Pauline van Dongen, actually work? „Several sensors measure the shoulder angle in relation to the lower back. These sensors and algorithms were developed together with physiotherapists. At the Universität Duisburg-Essen, students designed the first industrial prototypes and tested them under the guidance of lecturers.“

“Preventative health  
through self-help”

Jasper Dijkman

Preventative health through self-help is the motto of Fysiopal. It is actually a luxury product, admits Dijkman, but it can help employees to overcome many complaints and, therefore, represents major cost savings for employers. It may, therefore, be of interest to large companies or public authorities. After the grant, which was used to develop the prototype, it is now time for Business to Business - Crowdfunding or a venture capitalist to invest in the product. Dijkman is already thinking of the first 1,000 units. „Then, the production process will be operational and profitable.“



## Intelligent T-shirts, a healthy office

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# Mapping the brain without stress



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Although an MRI scan generally provides a lot of useful information about our body and, in particular, the secrets of our brain, for many people it is an invasive event that is perceived as very unpleasant. Reinier van 't Hooft explains how, with the development of fVision, Medintec has succeeded in making tomography more bearable for patients while at the same time providing additional data about the function of and deviations in the brain. „fVision is a pair of goggles for patients who are undergoing an MRI. The goggles cover the eyes and ears completely, meaning patients receive no stimuli from outside. Using a display of images, they can carry out specific tasks in which brain activity is stimulated. Using brain mapping, the functional properties and exact position of the various functional areas can be mapped.

Many patients find it difficult to undergo an MRI, because they feel claustrophobic in the chamber or the noise is perceived as very unpleasant. fVision provides the necessary distraction, even allowing them to completely forget where they are at that moment. This means they remain relaxed lying down, don't get restless and don't move. For many MRI patients who suffer from claustrophobia, a general anaesthetic is no longer necessary. Instead, light sedation is adequate.“

The feasibility study for the near-eye vision optics of the goggles has been completed, but there are still plenty of challenges ahead, according to van 't Hooft. „The electronics for all specific magnetic field strengths still have to be developed. We are also working on making the VR/3D image quality more realistic.“

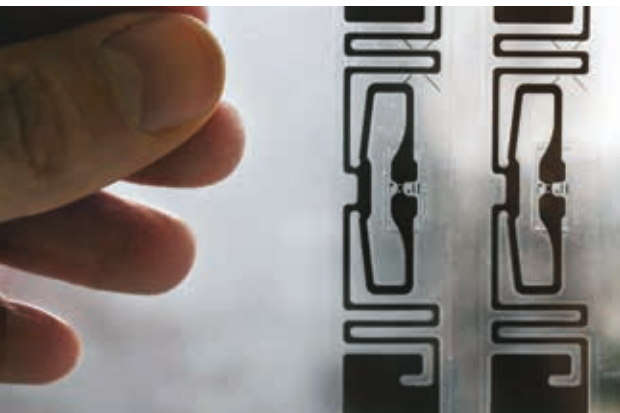
Contacts in Radboud UMC referred van 't Hooft to the possibilities of the Knowledge Alliance. The German company spark.ID, which specialises in industrial design, is responsible for the design and integration of the display into the goggles. The Hochschule Rhein-Waal in Kleve is assisting in the calculations for optical customisation; shortly thereafter a first prototype should be ready for use. This cross-border cooperation will be expanded if necessary. The next phase is the definitive development, followed by certification, which is costly and time-consuming.

“With the video goggles,  
the patient feels relaxed”

Reinier van 't Hooft

In the meantime, Medintec is of course also looking to the future. „Use of fVision even during operations could be a spin-off. The video goggles can prevent stress, so that more operations can be carried out under local anaesthetic. But first the diagnostic MRI scanners are planned. There are approximately 35,000 of these in use in hospitals around the world. And each year approximately 2,000 new MRI scanners are installed. We see all of these as potential customers.“

Imagine you're walking through the supermarket, and your trolley is full of all kinds of products. You'd like to know how much it will all cost, but don't feel like holding every block of cheese, piece of broccoli or bar of chocolate individually under a scanner, let alone calculating it all in your head. Instead you simply hold your smartphone near the shopping trolley and it calculates how much your purchases will cost. Even at the cash register, there's no need to scan all the products: the total due is displayed at the press of a button. A pipe dream? Not quite, because this technology is currently being worked on in the project ID4US. Prof. Dr. Thomas Kaiser explains how the technology works: „We can attach specific electronics to almost all products, which can immediately display all of the product information on the basis of so-called radio frequency identification. Strictly speaking, ID4US is a replacement for the bar code. This allows for a wide range of possible applications. Using our new technology, for example, stamps on letters could also be replaced,“ says Kaiser.



The hyper-modern bar code.

“We can replace the classic bar code.”

Prof. Dr. Thomas Kaiser

Everything that currently has a bar code could be replaced by ID4US. This could be interesting for consumers, and of course for numerous other areas of the industry in which, for example, a large number of products are automatically scanned on a conveyor belt. „Or even in the lab. For example, blood samples could be identified in this way. It operates automatically for the most part, meaning the risk of mix-up is incredibly low.“

Progressive digital signal processing in combination with technical advances in printable electronics is leading inevitably to these chip-less bar codes. Sounds complicated? It is. ID4US is working with three Dutch and three German partners who are lending their specific expertise to a product that is constantly renewing itself.

Kaiser: „We are also working intensively on extending the range of the codes. By optimising the efficiency of the codes, the data from a specific product can be scanned and recognised from 20 metres away. The grant funding helped us to develop a first demo. In approximately three years our product should actually be on the market. We are already in talks with investors. We want to grow internationally, because the demand for our product will be high everywhere.“

Advanced digital  
signal processing.

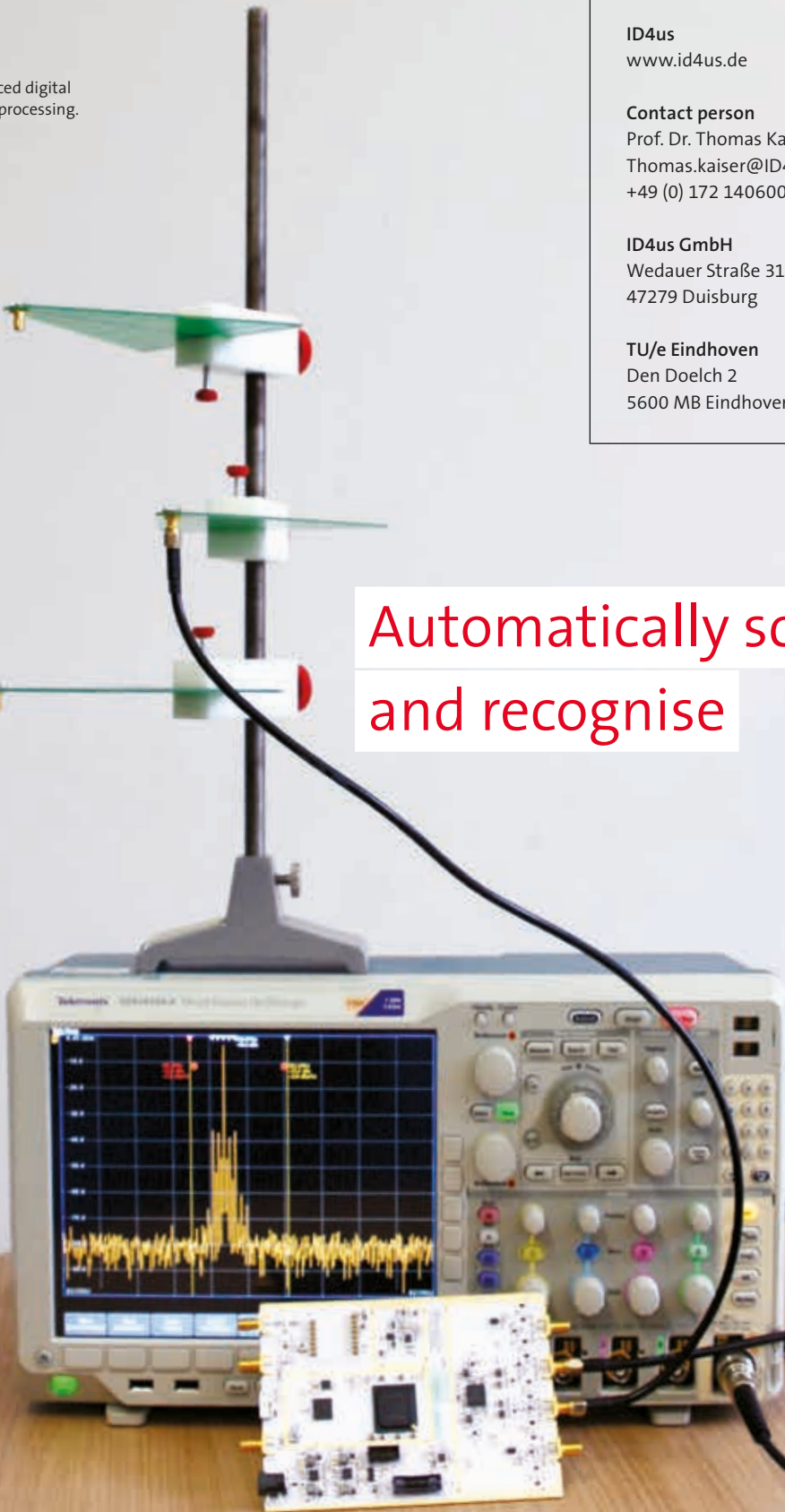
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5600 MB Eindhoven

Automatically scan  
and recognise



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Help from  
a digital duck

Digital and classic care  
go hand in hand.

Ask Alfred, he's always ready to help. That's what Ask Alfred means, in a nutshell. Merijn Klarenbeek explains the latest project from his company, MindAffect: „Alfred is a digital buddy who helps children from four to twelve years of age in hospitals. The children can ask Alfred specific questions on an iPad. Who might they meet today in the hospital? What is actually an anaesthetist? Alfred gives clear answers, creating a constant exchange between the digital duck and the child.“

„Alfred“ is of course the well-known Dutch cartoon duck, Alfred Jodocus Kwak. His creator is the Dutch cabaret artist and singer, Herman van Veen, and he was illustrated by the German Harald Siepermann. Alfred Jodocus Kwak is a true icon and has delighted children for decades. Klarenbeek: „In addition to information about the day's schedule, Alfred also provides distraction in the form of films, songs and games. Furthermore, Alfred can replace the bell button, allowing the child to call a nurse through an app. In many hospitals and medical institutions, the information and entertainment options on offer are not aimed specifically at children, but of course Alfred very much is. The duck can also take on the tasks of staff, e.g. providing distraction and information, which can in turn represent savings for the hospital.“

Before a child begins contact with Ask Alfred, the name and age of the child is set so that Alfred speaks the language of the child in question. „The first reactions of children have been very positive,“ says Klarenbeek. „Ask Alfred is seen as easy to understand and accessible. The software offers every hospital the opportunity to use its own symbol or character. We plan to also offer the system to children in several hospitals in the Netherlands or Germany in 2015.

MindAffect is a company focused on the development of communications software for interaction, e-learning and e-coaching. Prof. Peter Desain from Radboud Universiteit applied to the start-up initiative with the idea for Ask Alfred, following which they developed the app together. The content of the questions and answers was developed in conjunction with experts from Radboud UMC in Nijmegen, where a test phase is ongoing. The Alfred J. Kwak Foundation is offering support through its experience with children in difficult situations.

“Ask Alfred takes on some of the nursing staff's tasks.”

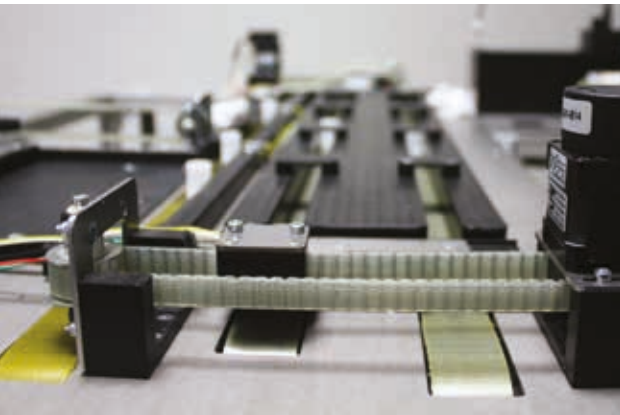
Merijn Klarenbeek

The application for a grant was processed quickly, according to Klarenbeek. „By creating a business model and going through the application process, you are also forced to work out the plan both in terms of content and financing right down to the smallest detail.“



Many people take it for granted: clean water. But it is the result of a long process. Once used, water generally returns to the ecosystem through rivers. These provide water companies with water of vastly differing qualities from which drinking water must be obtained again. After costly tests, preparation and filtering processes have been carried out it finally flows again as fresh drinking water from the tap.

At first, it seems like there's no problem here. But the fact is that water quality in the ecosystem fluctuates wildly depending on environmental conditions and the time of year. mercatronics from Bocholt has started a project with its Dutch partner, Promicol, to provide assistance here. The idea: if there was a compact device that automatically determined significant water values such as



the toxicity and bacterial load, and could transmit reports, it could be positioned at a large number of measurement points and consequently predict the load of the incoming water. The preparation of water could be determined more precisely and, therefore, be carried out in a much more energy-efficient and cost-efficient manner.

Mercatronics managing director Jens Diepenbruck explains how he and his colleagues developed a machine that could do just this. „We use a modern measuring procedure based on bioluminescence to measure microorganisms and toxins. The machine, at a size of approximately half a cubic metre, can automatically measure the quality of a water sample in an hour. This machine can operate fully automatically without any human intervention for one week.“

Diepenbruck emphasises the significance of water analyses in an earlier study. „London is a good example. Due to frequent use of the contraceptive pill, there was an increased hormone content in the waste water there and, consequently, in the tap water. The contamination of water with hormones had significant effects on all life forms living in and from the water. This scenario could be prevented by testing the water early and accurately.“ It is clear that early water tests make sense all over the world. In future, process water e.g. in power plant cooling towers, will be tested, but of course there are other possible areas of application, such as a paper factory, where a lot of water is used. The Knowledge Alliance helped mercatronics in the development of a functional model and the prototype. „It was great that we could ask questions throughout all the phases and get feedback at an early stage.“ As for the future of mercatronics and the new system, Diepenbruck is optimistic, not least because the United Nations has recognised the right of access to clean drinking water as a human right. „Hopefully this will bring us one step closer on the way to clean water for the whole world. We at mercatronics will be happy to contribute.“



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“Test water early  
and accurately”

Jens Diepenbruck

# Clean water: a good start

Testing water for toxins  
and bacteria with light technology.

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# Health before birth

Seeing the real-time heart signals  
of the unborn child.

We see a pregnant woman lying in a hospital bed. On her stomach are electrodes, which are connected to a device by wires. That, in a nutshell, is Nemo Healthcare. But what exactly is happening here? „We have developed a new technology to monitor pregnancies better from the outside with the aid of signals from the woman’s own body,“ is how Bas Lemmens summarises his project. „We measure the heart tones of the unborn child in real-time on the stomach, and also observe the woman’s contractions.“

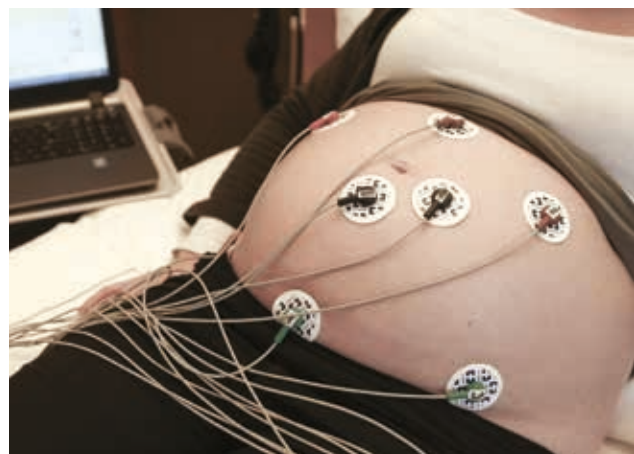
„For a long time it has been possible to monitor the health and development of the foetus preventatively with sensors, but this method is not known internationally,“ says Lemmens. „Using the latest technology, we can obtain electrophysiological information that other comparable systems - whether old or new - cannot provide. With the aid of an ECG signal (electrocardiogram), we can see a live video feed of the unborn child’s heart. The biggest challenge in filtering the information is removing background noise. The mother’s heart is much bigger and stronger and is in the way, so to speak. When you compare it to an ultrasound, you could say that it is a black and white photo, while we can show a colour video that immediately displays the relevant data to the hospital staff.“ Nemo Healthcare started as a spin-off from research cooperation between the Technische Universiteit Eindhoven and the Máxima Medisch Centrum in Verdhoven.

The clinic was researching better monitoring during pregnancy. The grant was used to further develop a new prototype which is currently being tested. A German company is responsible for the usability design, while Radboud UMD assisted in creating useful contacts, among other things.

“We understand  
how the human body works.”

Bas Lemmens

The end users are midwives and gynaecologists, but the direct customers are distributors who offer the device to hospitals. Lemmens expects the first end products to be available on the market at the end of 2016, but is already looking further ahead in the future. „At the moment, Nemo Healthcare links in to all of the hospital’s monitoring systems, which already have a certain level of infrastructure. In the medium term, women could also be able to use the device at home. We understand how the human body works, how we filter out the right information and how to subsequently make this readable. In five years, we will definitely have to set a new standard in the field of pregnancy monitoring, of that I am convinced.“



The electrodes filter out the useful signals.

# Knowledge- alliance Rhine-Waal

“Practical solutions  
go hand in hand  
with an architectural  
approach”

Michael Göke

“Adhesive tape saves time,  
money and lives.”

Johan Bender

“We can replace  
the classic bar code.”

Prof. Dr. Thomas Kaiser

“First you develop a product,  
then the business”

Koen Koevoets

Partner



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