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Unique ink and applications verified in research projects

Active ink from Polyscorp Invent

PHOTO: POLYSCORP INVENT

“Due to the fact that Polyscorp had the opportunity of developing its collaboration with researchers at Innventia and KTH Royal Institute of Technology, our ink products have been systematically documented and verified. This process has meant a real boost for the whole company and it has brought our products closer to the market,” says Lars Andersson, the central figure in a small but very innovative company called Polyscorp Invent AB.

Today, Polyscorp has been participating in established research projects such as Innojet and iPac, which has generated a high level of credibility for Polyscorp as a company and as a collaborative partner. The unique Polyscorp technical solutions for what is called non-conventional ink, such as electric-conductive, temperature-sensitive or fluorescent inks, has been met with a great deal of interest from the industry for a long time. However, it is difficult for a company without a capital base or employees to proceed with industrial projects all by itself. It can also be hard to get support for development projects, which is a reality that Lars would like to change.



Lars Andersson,
CEO, Polyscorp Invent

“Much more development money should be invested in projects that have the potential of being developed for production and growth on a large scale, through collaboration with research scientists. In my opinion, today, much too many development resources are being invested in smaller and short-term projects that only strengthen the competitiveness of a company. These projects often produce results rather fast, yet many of them lack growth potential. I'd prefer it if there were investments in projects that would generate production and growth on a large scale.”

Lars sees a lot of potential in establishing more collaboration among researchers and small creative companies.

“Innovations are often produced in small companies that don't have the capital and resources to take things further. Contacts in the field of research are one means of raising these innovations to an industrial level.”

Polyscorp was given a boost as a result of its collaboration with Innventia. In the beginning, it was Polyscorp that contacted Innventia because it needed to measure printing quality and functionality scientifically. It came across Innventia after asking around. After a few discussions, Lars was asked if he could supply fluorescent ink to the Innojet Project.

“I give Innventia all the credit for seeing the potential in our expertise and our products as well as for taking us into the project,” continues Lars. “The researchers at Innventia saw the potential. Their credibility and network provided us with even more contacts and participation in an additional project.”

Lars and Polyscorp Invent have a stake in building up a network with small creative companies and major suppliers.

“We chose to establish collaboration instead of buying or being bought,” adds Lars. “Today, our situation is such that we can rapidly scale production up, due to the fact that we've got large-scale producers in our network.”

Apart from a certain frustration with things taking a long time to come to fruition, today, Lars is optimistic nevertheless. The lack of capital in Polyscorp has contributed to it having to concentrate on a few efficient solutions. The company is currently participating in several promising projects, with interest from the industry being greater than ever.

“We've had interested parties, as such, for a long time. But, these days, there is another attitude to new things in the industry, when the people in it are considerably more positive towards and interested in introducing technical innovations.”

Thus, with the scientific verification of ink, raw materials and processes, Polyscorp will perhaps be able to provide a boost for the industry while, at the same time, offer Swedish industry new possibilities. Inkjet technology with non-conventional ink has enormous potential, especially when it comes to printing on packaging.

In conclusion, Lars says, “The most exciting thing at the moment is our new microdriver of thick film technology that will make display products possible, which is of a great deal of interest, when it comes to price and function. Polyscorp is now looking for partners to gear up the technology to produce millions of copies, in order to obtain the low production costs that would make this product revolutionary in comparison with existing technologies.” ●

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 **-Genom att Polyscorp** fått möjlighet att utveckla samarbeten med forskare vid Innventia och KTH, har våra bläckprodukter blivit systematiskt dokumenterade och verifierade. Detta är en process som lyft hela företaget och tagit våra produkter närmare marknaden, säger Lars Andersson, Polyscorp Invent AB. Han ser en stor potential i att skapa fler samarbeten mellan forskare och små kreativa företag för att lyfta innovationer till industriell nivå.

Polyscorp är idag en del i etablerade forskningsprojekt som Innojet och iPac, något som skapat en högre trovärdighet för Polyscorp som företag och samarbetspartner. Intresset från industrin är högre än någonsin.

– I dag är man inom industrin betydligt mer positiv och intresserad av att introducera tekniska nyheter.

Current awareness from the Innventia Group

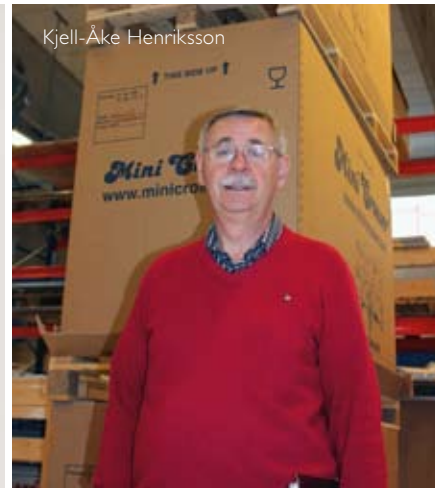


PHOTO: FOTOGRAF JOHAN OLSSON / NILS LINDSTRAND

Systematic Development work led to more efficient packaging

A package is a part of a product. This concept led to Ericsson being more efficient in developing solutions for packaging.

A very successful pilot project is presently in progress. Systematic Development of packages is now in demand in Ericsson and the package is included in new development projects from the very start.

"This idea was born when an in-house study showed the need for finding good routines and systems for dealing with packages," states Mats Lundgren, Head of Packaging Material Development at Ericsson. "It often happened that the demand for a solution to a package first arose when the product was starting to be produced on a large scale, and so the notice we were given was much too short. In reality, the results from this situation were many unique and over-dimensioned packages."

The study clearly showed that there was considerable potential.

"We were able to become more efficient by being more interactive with the development of the product," continues Mats. "The concept of making packaging a part of a product was the key. Suddenly, it all became obvious to us. For a long time, there have been well thought out and tested routines at Ericsson for han-

dling components, allocating responsibility and planning projects. When we actually decided that packaging should be on equal footing with the other parts of a product, it was quite easy to include it in the same routines. It also became simpler to coordinate the development of a product and its packaging."

Mats contacted Innventia in connection with Ericsson carrying out a pilot project dealing with a new packaging solution for base stations. Developing a package was part of things from the start. Extensive testing in the packaging laboratory at Innventia showed that the strength of the product was greater than what had previously been estimated. As a result, it was possible to reduce or completely take away the padding material and use corrugated board as the material in the box.

Today, the new development department is receiving many enquiries about solutions for packaging.

"Projects are coming to us now," says Mats.

The biggest improvements lie in the fact that the packages have become cheaper while, at the same time, they have been lighter and smaller, which has led to a reduction in their effects on the environment and climate, as well as more financial profits, due to lower transportation costs and environmental fees.

Mats comments, "It will probably take a few years before this new way of working is established throughout Ericsson. It concerns the development of packages for all the new products as well as adapting and upgrading the existing packages. This is a major task in a company such as Ericsson. But, as I said, interest is great and, today, our development resources and systems have been established. Developments are going to go fast now."

Kjell-Åke Henriksson at Innventia points out that the collaboration with Ericsson has been extremely successful. Looking at packaging as a part of a product leads to more benefits and lower costs. It also contributes to a broader perspective of the whole development.

Kjell-Åke comments, "We really want to have the designers of a product present at our tests. It's then that it's possible to optimise a product and its packaging at the same time. The result is often a product that withstands the stresses better during transportation and when being operated." ●

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Förpackningen är en del av produkten. Den insikten gav Ericsson en effektivare utveckling av förpackningslösningar. Tidigare kom kraven på förpackningslösningar först när produkten skulle börja volymproduceras, och fick därför alltför kort tid på sig. Resultatet blev många unika och ofta överdimensionerade förpackningar.

I samband med ett pilotprojekt kring en ny förpackningslösning för basstationer togs kontakt med Innventia. Omfattande tester resulterade i att dämpningsmaterial kunde minskas eller tas bort helt, och wellpapp användas som material i lådan. Förpackningarna blev billigare, samtidigt som de blev lättare och mindre, vilket ger lägre miljö- och klimatpåverkan samt ekonomiska vinster genom lägre transportkostnader och miljöavgifter.

Nu är Systematisk förpackningsutveckling efterfrågad inom Ericsson, och i nya utvecklingsprojekt finns förpackningen med från början.



Mats Lundgren
Head of Packaging
Material Development,
Ericsson



Södra Innovation concentrates on creative collaboration throughout its value chains

When the formation of Södra Innovation took place in the middle of 2009, Södra restructured itself, when it came to its innovation work. The R & D Department, with its forty-five employees that had previously been a part of Södra Cell, was merged with the staff that dealt with environment, energy and research matters on the Group level. In all, this has become a unit consisting of fifty-eight people. The new matrix organization, Södra Innovation, comprising R&D, Environment and Energy, Project Management and External Research, work for all of Södra. It is expected that there will be advantages as a result of synergy effects and of the fact that this

will lead to a comprehensive view of development issues that will apply to the entire Group. Södra Innovation is based at Värö Mill. The manager of the unit is Karin Emilsson.

“Södra Innovation is still being formed,” says Camilla Rööst, Manager of the R&D Department in Södra Innovation. “This is a new way of working for Södra, with joint research resources for the whole Group. We’re currently filling the remaining vacancies and we’re working on a broad front to develop working methods and cooperation throughout all of Södra Innovation.”

In recent years, Södra has been developing its R&D work in another way. The

development of new products has generated a need for new constellations for many development projects.

“Today, more than before, we’re working jointly on development projects with other companies throughout the Södra value chains,” continues Camilla. “With such a grouping in a project, it’s easier to increase the benefits that each one gets from a project, instead of needing to be careful of the risk of revealing too much about ideas and knowledge to competing companies. A definite win-win situation comes from development projects that assemble parties in a value chain. When the contracts are finalised concerning how rights and results are to be shared

Södra and Innventia have an extensive collaboration on research and development. One recent example of this collaboration is an innovative composite material which has been demonstrated in a child's chair, called Parupu. Another example is the joint mill trials on the use of lignin fuel in lime kilns.



Parupu means pulp in Japanese. Parupu is also the name of a chair developed in a joint project between Södra Cell, Claesson Koivisto Rune. The purpose of the project was to prove the usability and potential of a composite material based on pulp and PLA.

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During a three-day trial at Södra Cell in Mönsterås, in April 2008, the potential of replacing fossil oil with lignin was successfully demonstrated. With its thermal value of 27 MJ/kg, lignin is one of the few biofuels that comes close to fossil oil, which has a thermal value of 40 MJ/kg.

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among the participating companies and research partners, in our experience, this leads to a creative project, which can mean rapid progress.”

Historically, the main focus of Södra research has been on a broad cooperation in its line of business, which, in practice, involved working together with competitors. This kind of project and programme is still being run for a string of issues concerning process technology and other areas, where competitiveness does not mean so much. In particular, Södra is participating in several of the Innventia Research Clusters.



Camilla Rööst,
Södra Innovation

Camilla says, “We’re venturing almost as much as we did before. We see this as an important basis. However, a lot of the increase in research and development lies in projects that include partners along the value chain of a product.”

When it comes to research partners, Södra carries out extensive collaborative work with Chalmers, its ‘home university of technology’, which is close to Södra Innovation in Värö and Innventia.

Camilla adds, “But it’s important to emphasise that, in every individual collaborative project, we endeavour to ally ourselves with partners that have the best expertise for that particular project. ●



Med skapandet av Södra Innovation sommaren 2009 förändrade Södra sin struktur för innovationsarbetet. Man har på senare år också utvecklat sitt FoU-arbete på andra sätt.

– Vi arbetar i dag mer än förr med utvecklingsprojekt tillsammans med andra företag inom Södras värdekedjor, säger Camilla Rööst, som är chef för FoU-avdelningen. Med den sammansättningen i ett projekt kan man lättare förstärka varandras fördelar av projektet, i stället för att behöva vara försiktig med tanke på risken för att ge bort för mycket av idéer och kunskaper till konkurrentföretag.

Fortfarande drivs även breda branschvisa samarbeten för en rad frågor kring processteknik och andra områden där konkurrensen betyder mindre. Inte minst deltar Södra i flera av Innventias forskningkluster.

Danish packaging producer Brøderne Hartmann A/S is dedicated to designing and producing customer specific and environmentally friendly packaging products from moulded fibres. It develops technology and produces machinery for moulded fibre production. Historically, Hartmann has concentrated on carrying out developments in the company, which is an aspect that has changed in recent years.

“In the past, we’ve relied very much on our own capabilities for improving and developing our production processes and technologies,” says CEO Peter A. Poulsen. “Now and in the future, we’ll work more closely together with selected partners that are specialised in different key areas.

Our aim is to improve the speed in the development of products and production technology.”

When Hartmann selected Innventia as one of its chosen partners and signed a partnership agreement in March this year, the two companies had been working together on specific projects for quite some time.

“We knew Innventia as having expertise in the areas where we wanted to complement our own resources,” says Tomas Schou Winther, Director of R&D and Sustainability at Hartmann. “I was convinced that we would benefit from further development of this cooperation.”

One area, where Hartmann hopes to improve its development work through working with Innventia, is to calculate the strength of new products at an earlier stage.

“Hartmann is continually designing customer specific products, a process that includes drawings, mock-up models and prototypes. If we can model function and strength earlier in this process, we can serve our customers better and improve the speed of the design process. Innventia has advanced software for these calculations and experience from working with fibre materials and packaging, specifically.”

Hartmann is a partner in two Innventia Multi-client projects, the Wood-Derived Renewables Cluster and the new CREPs project. The cooperation between Hartmann and Innventia includes more applied research projects too.

“We have R&D resources of our own, both laboratory facilities and staff,” says

Hartmann has a stake in speeding up design and development



PHOTO: BRØDERNE HARTMANN A/S

Tomas. “But, needless to say, Innventia adds to this, which makes us more equipped to meet the demands of our customers and to support our performance, when it comes to sustainability.”

Hartmann holds a very strong position in sustainability, using recycled wood fibres as the raw material. However, producing packaging for food and for sensitive industrial products and kidney bowls for hospitals, provides no room for compromise in quality and function.

“It’s important for us to work with partners like Innventia that have the knowledge and know-how to work with very specific development issues,” says Tomas. ●

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Innventias senaste partnerföretag, den danska förpackningstillverkaren Br. Hartmann, bedrev tidigare all utveckling inom det egna företaget. Detta har förändrats.

– För att snabba upp utvecklingen av nya produkter och teknologier, har vi valt att samarbeta tillsammans med utvalda partners som är specialiserade inom sina områden, säger CEO Peter A. Poulsen.

Genom att utöka sitt samarbete med Innventia hoppas man bl.a. kunna beräkna styrkan hos nya produkter i ett tidigare skede. Modellering av funktion och styrka tidigt i processen ska förbättra såväl kunderbudande som designprocesser. Det är också viktigt att samarbeta med experter som Innventia när det gäller utveckling av speciellt kvalitetskrävande produkter.



Duni keeping a check on materials

PHOTO: DUNI

Duni sells a great number of different products that are used in contact with foodstuffs as well as products that are in use near people's mouths. Others come in contact with the skin. Duni produces its own tissue products at a paper mill in Skåpafors, west of Lake Vänern. Other products are converted by Duni in Germany and Poland. In addition, it purchases finished products from various parts of the world.

Product safety is a requisite for Duni operations, not least when it concerns being innovative and introducing new products. The demand for safety applies to the basic materials, e.g. paper and plastic, to the decorative colours and to other materials that make up the final products.

"Environmental issues exist in everything we do," states Ulrika Hansson of Duni AB. "Today, it's important to have a range of environmental products, but we would prefer to use environmentally sustainable materials in all our products. New bio-based materials are occurring in more and more fields. Many of our products are totally or predominantly made of paper, which is already a bio-based material. However, more and more bio-based materials are appearing and are able to replace traditional plastic materials."

New materials are making demands on the Duni Development Department in Malmö. There are six people in the Department.

"When a new material breaks through and becomes available to us at Duni, we would prefer it if we can be clear about how we could utilise it," continues Ulrika. "Above all, we have to be certain that it will be safe for consumers."

Furthermore, working with a material to be used in contact with foodstuffs means that the EU makes strict demands on consumer safety being documented in accordance with a set of extensive regulations. In the first place, Duni requires its suppliers to take their responsibility. All the papers have to be in order, such as proof of product safety, documented social responsibility from suppliers and data concerning the effect of the material on the environment.

"We always visit potential suppliers before dealing with them," explains Ulrika. "We have to be certain that suppliers meet the demands we make. In fact, most of our development projects are carried out in cooperation with suppliers."

In order to check with and verify suppliers' own tests, a relatively large number of samples of a material are spot tested by independent laboratories. Innventia is often used as a partner for obtaining reliable measurements of extractives, for example.

Ulrika explains, "It's very necessary for us to obtain reliable results from these tests. It's vital to have a partner like Innventia, which has a deep knowledge of matters concerning materials and which is very expert at carrying out tests on them."

Kai-Yee Thim works with chemical analysis at Innventia. She confirms that the capacity for carrying out analyses at Innventia is important, since there is often pressure on time when Duni needs tests to be done.

Kai-Yee comments, "But the most important thing is probably that we at Innventia have broad knowledge and know-how about different materials and analytical methods. We can give advice about tests that are suitable for a particular requirement." ●

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Produktsäkerhet är en förutsättning för Dunis verksamhet, inte minst när det gäller att vara innovativ och introducera nya produkter. Säkerhetskraven gäller både grundmaterialen, som papper och plast, och dekorfärger och andra material som kompletterar den färdiga produkten.

– Det finns miljöaspekter i allt vi gör; konstaterar Ulrika Hansson, Duni AB. I dag är det viktigt att ha miljösortiment, men vi vill helst använda miljömässigt uthålliga material till alla produkter.

Nya material ställer krav på Dunis utvecklingsavdelning. För att kunna kontrollera och verifiera leverantörernas egna tester stickprovskontrolleras materialprov av neutrala laboratorier. Ofta använder man Innventia som partner för att få tillförlitliga mätningar av till exempel extraktion.

Profile



Catherine Östlund

One of the experts in image analysis at Innventia is Catherine Östlund. During her ten years with the company, she has worked with various kinds of image analyses, from measuring fibre dimensions to estimating ink bleed to evaluating the surface structure of press felt.

"There are images everywhere. Irrespective of whether you work with wood, paper and board or in completely different areas, such as medicine or the environment, it's possible to obtain information about materials using image analysis. At the moment, for example, we've got a customer who's looking at rodent bones using our new X-ray tomograph." (See insert on page 7.)

Catherine's career started out when she was an engineering physics student at Uppsala University. She followed this up with research studies at the Centre for Image Analysis in Uppsala, where she did a doctorate on multi-spectral images in environmental applications.

She has been part-time back at the university since 2007, as an assistant supervisor in the beginning. Since 2009, a grant from the VINNOVA VINNMER Programme has made it possible for her to spend half of her work time in Uppsala on researching and studying different methods of image analysis.

"So far, we've mainly examined different methods for studying fibre flocs in paper. With the arrival of the new instrument at Innventia, it will be interesting to compare those results with 3-D images, to see what the flocs look like. I've also looked generally at various methods that we might be able to use to measure pores and fibre dimensions in 3-D, for instance."

It is not a problem for her to divide her work time between two workplaces. As for leisure activities, there is time for only one thing. Catherine and her husband are fully caught up in building a holiday house, which takes all their time, except possibly when driving the children to different activities or taking the dog for a walk or two ●

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PHOTO: VENTURE CUP/RICKARD LARSSON

Venture Cup finalists - Anna Wiberg & Daniel Söderberg

As a result of their work on the commercialisation of SOFA (STFI Online Forming Analyzer), Anna Wiberg and Daniel Söderberg have proceeded to the Best Business Plan category.

Venture Cup is a business plan competition whose aim is to assist people with business ideas, to realise them and to stimulate the creation of innovative companies. When participating in Venture Cup with an idea, you receive feedback, guidance, training and inspiration. This year, 1,077 business ideas competed. In spite of very strong competition, Anna and Daniel went on as one of twelve teams that took part in the big Swedish final on 9 June in Luleå.

New measurement technique for taking control of variations in quality

Anna and Daniel's work with commercialising SOFA has led to there being the first installation in a paper mill at Korsnäs Frövi.

SOFA is an online system, based on a fixed mounted measurement unit/measurement frame that continually makes measurements of the entire width of a web on a paper or board machine. The SOFA System has the potential for reducing the consumption of raw fibres by up to 5%. For an average Nordic paper mill (500,000 tonnes/year) this would mean a saving of approx. SEK 125

COMING EVENTS

SEPTEMBER

- 7 Information day: The Swedish Support Office for Forest-based Sector EU-research
- 15-17 Control Systems Conference
- 20-21 Research Seminar for Innventia Partner Customers

OCTOBER

- 4-6 Packaging Diploma Course
- 5-6 Chemical Analysis Seminar
- 26-27 SustainComp Open Conference
- 28 ForestBeyond Forum

For further information on coming events, see www.innventia.com



The SOFA System installed at the Korsnäs Board Mill in Frövi

million/year. In addition to this, it would mean a 50 GWh decrease in energy consumption per year. ●

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New instrument shows the minutest structure in 3D

A new X-ray tomograph, the MicroXCT-200, was inaugurated at Innventia on 24 March, with a seminar and a demonstration, when every available place was filled in Sundbladsalen. The participants listened to S. H. Lau from Xradia, the company that delivered the system. He presented methods and various applications for the X-ray tomograph. Professor Gunilla Borgefors from the Centre for Image Analysis at Uppsala University / the Swedish University of Agricultural Sciences in Uppsala delivered a paper on image analysis of 3D images.

Representing Innventia, Joanna Hornatowska and Catherine Östlund presented examples of new opportunities for research, development and problem-solving that the X-ray tomograph offers for wood fibre based materials. After refreshments had been taken, there was an opportunity to see the instrument in action.

The possibility of obtaining unique three-dimensional images of the character of a material without having to cut

it, dye it or spoil it in any way, certainly contributed to the enormous interest that Innventia met after the inauguration was over.

"Now everyone is curious about what their materials look like," says Catherine Östlund. "This instrument can be used for such a variety of materials. Among other things, it can be used to compare materials that are produced in different ways. We can analyse samples with a diameter of up to 10 mm. For maximum resolution, it's best if a sample is no bigger than 1 mm, which gives details to a degree of 1 µm."

The investment in the new X-ray tomograph was made possible due to a very generous grant made by the Nils and Dorte Troëdsson Foundation Research Fund. Since the inauguration, new equipment has been added that is able to compress or stretch out a material before being scanned. ●

MORE INFO: www.innventia.com/microscopy

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Joanna Hornatowska demonstrated the new MicroXCT-200.



S. H. Lau from Xradia.

Have you changed address?

Let us know by sending an e-mail to info@innventia.com.

B



Great interest in pilot plant for nanocellulose production

Since the press release about Innventia building a pilot plant for the production of nanocellulose, Mikael Ankerfors has been busy talking to media and companies interested in R&D collaboration. An important step towards industrialisation has been taken.



PHOTO: ISTVÁN SIRO/DAVID PLAKETT

Transparent film made from nanocellulose manufactured at Innventia.

“For a long time, there’s been a great deal of interest from industry in utilising nanocellulose as a strengthening component in other materials, such as paper, composites and plastics. Since our press release in May, we have noticed that many companies are ready to take further steps towards industrialisation,” says Mikael Ankerfors, a Research Manager at Innventia.

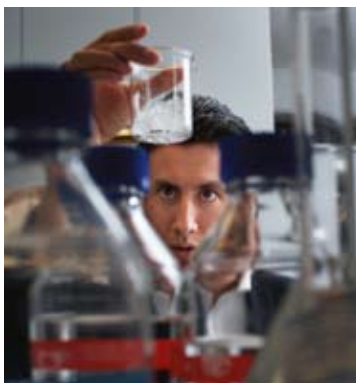
By constructing the first pilot plant in the world for producing on a larger scale, Innventia is now making a major investment in its new energy-efficient technology for nanocellulose production. Due to the process developments carried out by Innventia, the energy consumption

has been reduced by a total of 98%, which means the process being economically efficient for the first time.

“This is a natural step in the investment we’re making in nanocellulose. In order to develop applications, such as paper applications and composite materials, the raw material produced in a lab is not sufficient. As the only company in the world, we’re extremely proud to be able to offer industry real opportunities to participate in this field, which is so important for the future,” concludes Mikael. ●

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Nanocellulose is a material that is extracted from wood fibres. It has exceptional strength properties, being more or less as strong as Kevlar, a light weight material. This renewable material is going to have many areas of use in the future. For example, it can be used to make membranes and other reserve parts for the human body. It can also be used as a provider of viscosity in foodstuffs, replacing carbohydrates and other additives, or for creating more effective, environmentally compatible and renewable barrier films for packages used for foodstuffs. One immediate area of use is strengthening component in paper, composites and plastics.



In the laboratory, it is possible to produce some kilograms of nanocellulose per day. With the new pilot plant, the capacity will be tonnes per day. The production unit will be constructed on the site of the recently extended pilot papermaking facilities at Innventia.

 **Nu byggs** världens första pilotfabrik som gör det möjligt att arbeta med nanocellulosa i större skala. Innventia tar med denna storsatsning ett avgörande steg mot industrialisering av sin nya energieffektiva produktionsprocess som innebär en minskning av energiåtgången med 98%. Sedan pressmeddelandet i mitten av maj har förfrågningar strömmat in från företag som är intresserade av att utveckla nya produkter från nanocellulosa som är ett material med unika styrkeegenskaper i nivå med lättviktsmaterialet Kevlar. Nanocellulosa spås ha många användningsområden, inte minst inom livsmedelsindustrin.

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