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VISEDO ELECTRIFIES
heavy-duty machines and vehicles

SUSTAINABILITY
AND PROFITABILITY
go hand in hand



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“ There was growth with both existing and new customers.”

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Darekon puts effort into sustainability and digitalisation

Nowadays one can read about sustainability and digitalisation until boredom almost sets in. The significance of them is, however, self evident and essential. Both take the world in a better direction even if they also create fear as change always seems to do.

We at Darekon consider their role in our operation and the effect of our operations on them. We continue to automate and digitalise our internal and external processes and try to understand their effect on our operation. Our aim is to maintain and improve our competitiveness and make the continuation of profitable growth of the company possible and make sure of the well being of our employees and other stakeholders.

During the last fiscal year our revenue exceeded, for the first time, the milestone of 40 million euros. There was growth with both existing and new customers. At Darekon the clients have always been at the centre of our focus and will be in the future. According to our strategy we will continue as a supplier of versatile and flexible contract manufacturing services. We can see that there is a clear demand for them.

At the leading edge for further economical growth we have completed the expansion of our Haapavesi manufacturing facility. At the same time the machinery investments completed in Haapavesi and Gdansk have prepared the company for further growth. Everything is ready and we can powerfully respond to increasing demand.

In the customer introduction pages of this magazine you will find Visedo Oy, a company with an astonishing way to improve the efficiency of electric motors, and with their electric drivetrains raise the efficiency of many heavy duty vehicles and machines to a completely new level.

In our own operation we continuously strive to improve energy efficiency, develop material recycling and prefer renewable alternatives in our operation.

At our different plants the use of renewable energy and energy efficiency is at a reasonable level, as a survey made by Enegia shows. Read more about our sustainability activities on the following pages.

Kai Orpo

“

Our aim is to improve our competitiveness”



Vaisala honours suppliers with Sustainable Business Award

Vaisala, a global leader in environmental and industrial measurements, announced the recipients of its 2017 Supplier of the Year awards in July. Among them was Darekon.

The first ever Vaisala's Supplier of the Year awards were granted to five suppliers based on their outstanding performance. The top five were selected out of a total of 500 international suppliers. The award is the highest honour Vaisala can bestow upon a supplier.

Value-based operation

"To us at Vaisala, striving to become net positive is a vision that means doing business in a way that puts back more into society, the environment and the global economy than it takes out – having a bigger handprint than footprint," says **Kjell Forsén**, CEO at Vaisala. "Since the performance of the whole supply chain is crucial when it comes to responsibility, we want to encourage our suppliers towards that goal too."

The Supplier of the Year awardees were chosen by a global team of Vaisala's specialists in sourcing, purchasing, logistics, quality, manufacturing and R&D.

Customer service: Darekon Oy

Darekon merited recognition for good customer service thanks to its very fast response time as well as flexibility and adaptability to Vaisala's needs. A proactive approach to risk management produces solutions.

New web pages are part of Darekon's digital development



DAREKON'S web pages and platform have been updated to provide a fresh and informative look at the company. The starting point for

the update was to move the pages to a new platform – a responsive software – that shows the content well on a large screen of a comput-

er and on the smaller display of a mobile phone. At the same time the firm's objectives and core messages were redrafted.

The renewal of the site was carried out by Rajasoft Oy of Espoo, whose delivery process suited Darekon well. The result was a long lasting content structure and technical functionality that makes further development easy.

"Today web pages are very important for companies. They reflect the identity of a company and tell the reader what matters to the company," says **Jarkko Sipilä**,

CEO at Rajasoft. "At the same time the message is also directed to a firm's own personnel. The site shows where we are working and what is important for us. The pages are like a mental overall."

"The renewal of the pages succeeded very well," says **Kai Orpo**, CEO at Darekon. "The background of Darekon, quality orientation and above all service entirety is now introduced more clearly and logically than before. Usability with all different equipment is naturally important and all our core messages can be found more easily than previously."

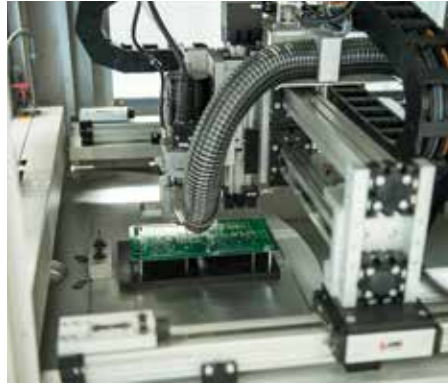
Equipment investments are needed all the time

A PCB ROUTER has been acquired for Darekon's Haapavesi plant, for gently de-paneling the boards.

The boards are attached to the production panel with a few bridges that are often perforated – small holes are drilled across the bridge. When the board is completed it is generally detached from the panel with manual cutters or a compressed air operated Hektor cutter.

Both tools leave a slightly jagged place at the edge of the board. The router opens the bridges neatly and accurately. With routing there is no bending force applied to the board, which might effect components very close to the bridges.

SELECTIVE coating is often needed for shielding PC-boards when, for instance, optical components or connectors must not be coated, or if there are only some critical areas to be coated. For this purpose the gluing robot at the Haapavesi facility has been supplemented with a coating dispensing nozzle and thus transformed into a selective coating robot.



PC-BOARDS are sometimes tiny, sometimes very large. The Ekra stencil printing machine at Haapavesi plant has been supplemented with an option for printing larger boards, up to 610mm long.

"For a contract manufacturer it is good to be prepared for extreme situations," says Haapavesi plant manager **Antti Järviuoma**. "Sometimes there are very large boards in production. Component placement or soldering have not been problems before and now we are able to screen print the largest boards."

The expansion at Haapavesi plant is now ready

THE HAAPAVESI plant's 1,440 square metre expansion is now complete in all its detail and open for business. The total space of almost 5,000 square metres has been reorganised and all equipment has been found its ideal place. During the spring the outer roof and lawn around the building were still being finished. Now the roof is ready and the lawn green.

SMD lines function perfectly in the new premises, manufacturing is more fluent, material streams are straightforward and the layout is clear. The Haapavesi plant introduction starts on page 16.



X-ray inspection and mounting line upgrade to Poland plant



A NORDSON DAGE X-ray inspection system for the quality insurance of demanding products has been acquired for Darekon's Polish manufacturing facility.

The X-ray system can be used for inspecting new products, starts of production series and random testing of

boards in production. X-ray inspection at the plant had previously been carried out by a partner but now the investment makes inspections faster.

"The investment is notable and improves our ability to take new demanding jobs in production," says **Kari Koponen**, Darekon's Polish business director.

One of the three SMD mounting lines has been upgraded to improve accuracy. The two new placement machines can mount 0201 components and fine pitch circuits more precisely.

"Electronics is getting smaller and smaller and we too receive smaller boards that require more accurate mounting," says Koponen. "The upgraded line is now the most accurate of our three lines and opens doors for manufacturing boards demanding high accuracy for instance for wireless technology."

They expand, recruit and upgrade in Gdansk

THE COMPANY operating in another wing of the newer Darekon facility in Gdansk has moved out and Darekon has rented the premises. A renovation and reorganising project is in the pipeline.

"We can for instance start production of larger new product families in a separate space, open new production cells and make our growth easier. The expansion is relatively small but important," says **Stawomir Wawryk**, Darekon's Polish plant director.

In Poland the firm is continuously recruiting for different positions. Wawryk enumerates engineer-level people recruited for quality insurance, documentation, project management, production development, sourcing and warehouse operations. Besides them more than 20 people have been recruited to the production team.

Wawryk also details the upgrade of the Polish facility's management system. The management system, used for more than a decade, has been upgraded to level ISO 9001:2015. At the same time the environmental management standard ISO 14001:2015 and medical devices standard ISO 13485:2012 have been certified.

Tero Järveläinen shows the "Base Machine" of Visedo, a 1,000 kilowatt liquid-cooled synchronous reluctance assisted permanent magnet motor.



MORE POWER, LESS FUEL, CLEANER AIR
IN AN ELECTRIC REVOLUTION

VISEDO ELECTRIFIES HEAVY-DUTY MACHINES AND VEHICLES

Electric motors use more than 40 per cent of the world's electrical energy. By developing steering technology it is possible to cut a remarkable part of that. Visedo has taken a leap further and also redesigned the electric motor.

Every few weeks there is news of how the electric drivetrains developed by Visedo are being used in new and versatile applications – from busses to stone crushers and forest harvesters to ships.

In most cases they are hybrid systems where the electric drivetrain working together with a combustion engine improves the performance and fuel economy of the machine.

Fast expansion and strong backing

Investors clearly trust Visedo. The company turned a 6.7 million euros revenue last year and just before Christmas raised 20 million euros of new capital in its latest financing round. The total capital raised by the company now stands at 35 million euros.

Visedo has also been widely acknowledged publicly. At the beginning of May the company was given an award by Finnish financial newspaper Kauppalehti for its strong growth. Visedo was founded in 2009, now employs more than 100 people and has practically doubled its revenue every year. Ninety per cent of the firm's products are exported with its main markets in Central Europe and Asia.

"We electrify all heavy duty machinery," says **Kimmo Rauma**, founder and CEO at Visedo. "Our intention is to remove pollution from the world by electrifying – nothing less. Initially the idea was to electrify heavy-duty machines, there was a strong

push for that in 2008-2009. We knew we had a team with knowledge and ability. With the fuel prices at that time it was economical to electrify 8 machines out of 12, payback time was less than three years."

Year 2012 was the most difficult for the company according to Rauma, as the oil price collapsed. It broke the whole foundation of the operation. They had, however, discovered that with their technology it was possible to increase the performance and productivity of machines through electrification. It resulted in a motor that was better than any achieved by earlier technology. The consequent saved fuel is just pure added value of course. The firm has developed on the back of this discovery and its technology has been used in the electrification of ships and busses among others. The plan is to grow to become a 30-50 million euro company by the year 2020.

Software and super capacitors

All of Visedo's technology is its own. Its device solutions are in principle divided into the control of technology, motors and energy storage. The technology is modular and flexibly scalable. At the core and, most importantly, is Visedo's software technology.

Electric motors are in fact simple machines and their efficiency is actually quite high. Visedo has however developed its own motor, the reluctance

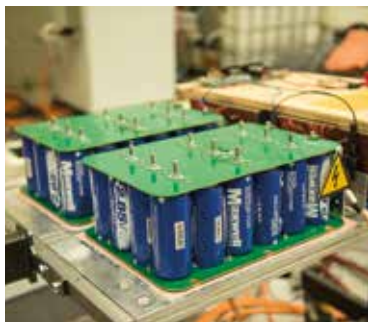
Normag is the first electric horizontal drill in the world. It does the same job in one day that takes a diesel-operated drill three days.



The Logset harvester gets over 70 per cent more power and 20-30 per cent lower fuel consumption with its Visedo diesel-electric drivetrain.



Visedo's PC-boards are large and heavy. The baseboards and copper are thick.



The power density of super capacitors is excellent. A package of 24 capacitors gives 340 kilojoules and up to 2,000 amperes current.

assisted permanent magnet synchronous motor. Essential to the motor is its efficiency in a wide speed and load range. The efficiency of an ordinary electric motor is at its best about 96 per cent, but only at a certain speed. Visedo's motors produce high efficiency in a very large speed range.

The motors are liquid cooled, totally shielded for harsh environments and smaller and lighter than traditional motors with the same power. The power range of the motors start from tens of kilowatts and the power of the biggest standard motor is one thousand kilowatts.

The steering units of the motors represent highly developed power electronics that is shielded in IP67 level enclosures. Power range is 50-2,000kW and like the motors, the steering units are also liquid cooled. Their selection includes frequency converters, DC-to-DC converters and their combination multiconverters in various power ranges.

The real deal in many of their machines is the Visedo energy storage unit based on super capacitors. For instance forest harvesters and digging machines require momentary high power in their movements. The power density of super capacitors is excellent and they can give very high power pulses for short periods.

The Visedo electric motor can be connected via the same axle with a combustion engine. At top load the electric motor can, for instance, double the power of the machine for a few seconds and at lower loads recharge the capacitors again. As a result a smaller combustion engine can be used in the machine and the engine can run almost continuously at the best power range. The productivity of the machine is thus increased and fuel is conserved.

Electric drivetrain revolutionises productivity

"Good scalability and high efficiency of our technology are keys in electrifying moving machines and vehicles," says **Tero Järveläinen**, Visedo and CTO at Visedo. "The electric drivetrain is so simple. In factories everything runs with electric motors too, there are no steam engines."

"Let's take the example of a hybrid stone crusher that crushes blocks of rock. A 40-tonne machine crushes 400 tonnes of rock in an hour at its best. With our technology the productivity of the machine is 40 per cent higher and fuel consumption 30 per cent lower compared to a crusher with just a diesel engine. The fuel saving alone is up to 16,000 liters in a year.

Another example Järveläinen describes is the ferry "Happiness" operating in the harbour of Kaoshiung in Taiwan. Replacing the 300 horsepower diesel engine of the 23-meter long 100-tonne ferry with a Visedo hybrid solution brought a 50 per cent saving in fuel consumption and emissions. Visedo has also electrified ferry traffic in Finland in the city of Turku. "Föri", the oldest ferry in Finland operating across the river Aura, got a completely electric drivetrain.

"Last year forest machine manufacturer Logset introduced the top model of their harvesters, equipped with our 175 kilowatt electric motor and super capacitor energy storage besides a 220 kilowatt diesel engine," continues Järveläinen. "The result is 380 kilowatt maximum power that takes the machine agilely up the steepest mountain slopes and makes felling and lifting the biggest trees easy."

There are plenty of other examples. One of the latest, introduced last spring, is the most powerful truck in the world: Sisu Polar Hybrid, 1,140hp/5,000Nm. A diesel engine and Visedo's electric motor are connected via the same axle. In rising hills the electric motor gives more power, in descents it loads the energy storage.

Three draw and ten write code

"We are at our strongest in projects and product development, while manufacturing is networked," says Järveläinen. "Here in Lappeenranta we make prototypes and small series, our main things are applications and design. On the other hand we also want to sell products, not just plans."

"Our cooperation with Darekon started very early, at least in 2010 when I joined Visedo my-



Taiwanese ferry Happiness is equipped with Visedo's drivetrain. The "plug-in hybrid" conserves 25,000 liters of fuel in a year.

self. Our PC-boards are not very complicated but they are large, have lots of components and many of them conduct remarkably high currents. Mechanical stresses are also high because of heavy components and vibration. The baseboards and copper are often very thick."

"We were actually looking for a supplier with a selective soldering machine," continues Järveläinen. "There are not so many of those in Finland and Darekon was the clearest choice. At the beginning we made lots of prototypes and that has always functioned well with Darekon. Soldering quality has always been excellent and there has been very few mistakes."

According to Järveläinen they have some 20 active boards and more than a hundred boards active to some extent. In total they have made 300-400 different versions of boards, so "that was a million euros", in Järveläinen's words. Typical run lengths are 10-100 pieces, a few hundreds at the most.

Visedo's production is very dynamic and schedules are tight. "We need the boards immediately once the design is ready," explains Järveläinen. Delivery times have however been met very well. Until now the operation has been to some extent "from hand to mouth" but during this year it has been possible to plan a little longer for the future.

"Four hundred boards and 400 parts on all of them," says Järveläinen. "All the boards have the same parts and the same software, but the use varies. At the moment three guys design and test boards, ten write code. Production boards never have wrap wires or other makeshift solutions because they must stand vibration and harsh envi-

ronments. The PowerMASTER steering board for instance is now in revision T, so it has been made in 15 revisions."

Production round the corner

Visedo has a large number of subcontractors and manufacturing partners. The frames for its motors and cabinets of active devices are made from demanding light alloy moulding. Thousands of punched iron plates are needed in the motors for making rotors and stators. The stators are coiled manually in Estonia using a rubber hammer. The work needs high precision but it is very monotonous.

Most of the PC-boards are manufactured at Darekon's Haapavesi plant. At the beginning Visedo acquired some essential components by themselves and sent them to Haapavesi. Now Darekon takes care of all the sourcing and management of components. Some sheet metal parts are also made at Darekon's Klaukkala facility. Cooperation between the two companies has developed steadily.

"From what I can see now, we will continue the same way," reckons Järveläinen. "Of course if we start making drivetrains for Chinese buses, for instance, we must also move the production there."

In the future one essential theme for development, according to Järveläinen, will be the accumulator. Connecting to the grid, comprehensive electrification of heavy-duty machines and managing accumulators are the firm's future visions. Accumulator and grid connection benefit from each other, the devices become more complicated but at the same time more versatile. ■



Darekon was the clearest choice."

Antti Järviluoma examines one of the new ventilation machines that was put in place during the renovation of the facility.



SUSTAINABILITY AND PROFITABILITY GO HAND IN HAND

Sustainability can be found across all Darekon's operations: from management systems to production, sourcing and facilities. When all aspects of the business are run tightly, sustainability also means economic efficiency and leads to the generation of as little waste as possible.

Energy consumption is the first thing that comes to mind when discussing sustainability and Darekon's facilities mainly benefit from district heating. Yet cooling is also needed in electronics manufacturing facilities where electricity powers Darekon's many production machines and controls the humidity and ventilation. Of course lighting is also required but its share of energy consumption is very small. Apart from energy, other important aspects for sustainability are material recycling, production methods designed to conserve materials and energy and consideration of environmental issues when sourcing.

Energy audit at Haapavesi plant

After the expansion and thorough renovation of the ventilation system at Darekon's Haapavesi facility, the company wanted to check that the building was functioning to a high standard. Enegia Group was chosen to make an audit. It is an independent expert and market leader in energy management in Finland. The auditing included proper functioning of ventilation, water and electrical systems in the facility together with locating opportunities to conserve heat, electricity and water and minimise expenses.

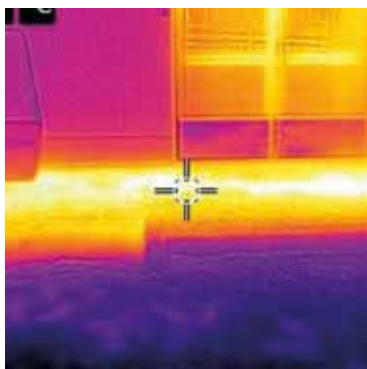
"Darekon has made all the necessary investments. In the audit we mainly examined that everything was in order and found extremely little to improve," says **Juho Linsuri**, energy specialist at Enegia. "Electronics manufacturers often consume a lot of energy but Darekon is from a completely different planet. Things have been taken care of and this is the most energy efficient plant I have visited for a very long time."

"Cooling is achieved cleverly with fifteen 300 meter deep energy wells that give enough cooling to take care of the heat from welding lines and other machines even during a hot summer day. During a frost they pre-heat the incoming ventilation."

"Industry in general wastes a lot of energy probably because the required payback time for investments is so short. If the payback time is five years or more, the investment will not be made."

Linsuri raises the issue of Finland's energy efficiency program which has just begun a new period for 2017 to 2025. Any company can join the program, make an energy efficiency agreement and pledge to reduce consumption by at least 7.5 per cent until the year 2025. Companies joining the program can also receive support for savings investments in traditional technologies. Free money in return for making savings!

The most remarkable single spot to conserve energy at Darekon's Haapavesi facility was the step heating in front of the main entrance, which sometimes heated the step when it was not needed.



The new FMS system acquired for Darekon's Klaukkala facility three years ago is servo-operated, conserves an essential amount of energy and needs no hydraulic oil.



Remnants of sheet metal production and all surplus material at all Darekon's plants is recycled.

As the result of the audit Enegia stated that at Haapavesi there is the potential to save three per cent of the energy bill. Things are well under control.

Production consumes energy and materials

Darekon manufactures a lot of electronics for medical equipment and water-soluble flux is often used in soldering. This minimises the risk that flux residue might under some circumstances cause – for instance – corrosion on printed circuit boards. This is especially important as the equipment being made has to be highly reliable in demanding circumstances.

The cleaning systems consume a lot of electricity and the plate power of both cleaning systems at Haapavesi is slightly over 100 kilowatt. The power of, for instance, a wave soldering machine or reflow oven is less than half of that. Cleaning systems also consume 20 per cent of the total water used at the facility, even if the water circulation is closed and the same water is cleaned and recycled over and over again.

Steam phase soldering is a good alternative in machine soldering, the advantages are a very small energy consumption and precisely controlled and even soldering temperature. Galden liquid for transferring temperature is inert and an environmentally friendly substance. The liquid is expensive but the process consumes very little of it.

Traditional soldering consumes much more material. Wave soldering machines hold a couple of hundred kilos of tin that is kept molten with 50 kilowatt heating resistors. The tin is in connection with air in the process, becomes oxidised and produces slag. Slag is of course stripped off from the top of the wave and fresh tin is added accordingly. One machine consumes hundreds of kilos of tin in a year. Darekon has, however, found a partner that buys the tin slag and recycles it for use. The volume of soldering done with the wave method is decreasing steadily.

Recycling channels have also been searched to accommodate solder paste. Some paste will often remain at the bottom of cans and it is recycled. Flux in the paste may also evaporate and the paste no longer functions properly. Sometimes it also gets old as each can has a use-by date. Previously the abandoned paste was sent to the firm Ekokem (Fortum since last spring), but now Darekon also has a partner that recycles the paste.

Sustainability keeps lights on

"Sustainability is a very multilateral issue," says **Jari Aspegren**, quality manager at Darekon. "It means considering ecological, social, economical and human issues in a way that keeps the earth usable and hopefully better than today, for future generations."

"Energy is an important issue and we have succeeded relatively well in conserving it, even if there are still things to do. In production a lot of material – almost everything – is recycled and in our sourcing policy we take into account material recyclability as far as possible. Waste materials are sold and waste formation is minimised at all stages. That is also economically beneficial."

"Many of our clients have strong principles of sustainability and we of course engage ourselves with that. We also try to tell our clients about various alternatives, raw materials and working methods and in cooperation with the clients develop products and production to be more sustainable and economical."

"Well being of personnel is the last and maybe the most important part of sustainability which affects the business. Social sustainability means, for instance, equality, fairness and community. Human sustainability means at the very least safe working methods and circumstances so work doesn't endanger anybody's health."

"We are committed to these objectives, they are documented in our management system, taken into use in all our units and evidence of compliance can be seen across the whole operation." ■



Sustainability is a very multilateral issue."

SALESMAN MIKKONEN VALUES

CONFIDENCE AND CHALLENGES

Pekka Mikkonen is a competitive man who is used to winning. An earlier tennis career took him to university in the US and after a double examination and Finnish military service his career went on to the electronics industry and sales work.



Pekka gives the ball a boost at a Finnish tennis tournament in Lohja in 2006.

The first impression you may get of Pekka is that he is reserved and does not want to talk about his personal life. That is probably due to the fact that he wants to keep his work and private life separate. When the discussion warms up Pekka, however, turns out to be an open-minded and sympathetic chap with clear ideas about his life values and objectives.

Abroad from Lohja and back again

Pekka is from the small town of Lohja and still lives there. The distance to his work at Klaukkala is 55 kilometers. His career in electronics began at Elcoteq just as it has been for so many other Lohja inhabitants. This 38 year-old man was there for a summer job in the past, assisting sourcing, though only for one summer.

Pekka's father played tennis with his brother for fun and that lit a spark for Pekka. He started training with a professional coach at the age of six and developed to become a skilled player. At junior level he gained several national medals and as an adult won his place amongst the top 20 players in Finland.

At one event in Helsinki Pekka took the opportunity to hear about educational possibilities in the USA. The result was that he got a scholarship from a US university, went there to study – and to play tennis.

Tennis and studies in America

The essential thing about winning his scholarship was the sporting success Pekka had achieved in Finland. It probably also helped that the sport operations manager of the university had a Finnish background. Pekka moved to a small, 50,000 inhabitant “red neck city” in Virginia and started to study and play tennis. And then he continued to study and play tennis... and not much else. Ac-

cording to Pekka life there was anything but what TV series may lend one to understand. In other words, rather dull.

The universities in America are not very cheap so it was better to study quickly and Pekka graduated two Bachelor of Science examinations in economics in 3.5 years. He returned home with management and global marketing management examinations in his pocket. And maybe a tennis ball or two.

To turn professional with his tennis would have meant entering a tough little world. Nevertheless, Pekka considers that he won all the possible benefits he could have from his tennis playing.

In the navy and electronics

Pekka was 23 when he returned home and joined the navy for military service. The tough seaman served on a missile boat and got acquainted with ships. Back home now in Lohja, however, there is no sea and Pekka doesn't own a boat.

After the service Pekka first worked in whatever job he could get – anything but commensurate with his education. Then he got a job at Darekon's competitor at the purchasing department as a substitute for maternity leave and after a year he got a position in sales at the firm. He worked at this job for five years and then there was a short period in sales for consumer electronics which did not suit.

After testing consumer sales Pekka applied for a job at Darekon and he was appointed sales manager in 2010. Three years later he was promoted to sales director. Pekka's primary job is to attract new clients and taking care of certain named clients.

One does not say “no” to a good salesman

“When I phone to a new potential customer, they seldom hang up and even open the door,” says



Pekka Mikkonen is a sympathetic man with admirable self-confidence.

“

One must listen carefully to the needs of the client.”

Pekka. “The skill of a salesperson is to give the customer in the first contact an impression that this guy must not be turned down. The time for selling the value of a meeting is about one minute, that is the time to create confidence. In this I don’t use any Yankee tricks but I won’t reveal my methods.”

“The first meeting must be sold by talking, but then one must listen and find solutions to the customer’s needs. Of course one can’t get all the deals and it would not necessarily be worth our while either.”

“I am competitive – I must always be the best or win, it tastes bad to loose. When I loose, I am very annoyed for a while. Then I start thinking about what I could do better the next time in order not to loose again.”

At home there is no need to compete

Pekka has a wife, a 7-year old son and a 3-year old daughter. His wife worked as a restaurant manager and is now just about to graduate as a nurse, and so luckily there is no need to compete with her.

There is some competitiveness in Pekka’s home life, however, as his son started tennis training with a professional coach at the age of three – so there is Pekka’s sporting heritage. His daughter may also start very soon.

The most important thing for Pekka is the physical and mental well being of him and his family, nothing can be more important. Football, although, also seems to be pretty important for

Pekka, who has been a Liverpool fan since he was a small kid.

“Some people believe football is a matter of life and death, I am very disappointed with that attitude. I can assure you it is much, much more important than that,” Pekka summarises the legendary Liverpool coach Bill Shankly.

Private life is important for Pekka. He tries to keep work and his private life separate and has also succeeded in that pretty well – work does not come home. Workmates are neither Facebook nor other pals. The friends from his private life tend to be childhood pals or acquaintances from hobbies and of course in Lohja almost everybody knows each other.

What will you be when you grow up?

Pekka is happy in his current job but of course is willing to answer the question.

“Professionally it doesn’t matter so much, as long as the task is interesting and challenging. And sometimes also fun. It doesn’t have to be sales but I don’t know what else it could be. Work is done in earnest but not with a wrinkled face. And it is possible to laugh in between. This is such a place and I enjoy it here very much.”

Pekka’s answer reflects his natural self-confidence. The word “no” doesn’t shake the salesman too much. “Self-confidence is knowing you are good,” grins Pekka. He must certainly have had parents who encouraged him to push himself forward. ■

Marko Roivas shows resin moulded connection and communication modules manufactured by Darekon. The entrance to Sandvik's test mine is in the background.



DAREKON AND SANDVIK COOPERATE IN MANUFACTURING AND RESEARCH PROJECTS

Darekon manufactures PC boards for Sandvik for very demanding circumstances. Darekon also manufactures sheet metal parts for many products and most of the products are moulded in resin.

Sandvik is an international, high-technology industrial group that employs about 45,000 people in the whole world and has revenue of 81.6 billion Swedish crowns or 8.6 billion euros. The Sandvik Mining and Rock Technology division manufactures products for breaking and moving rock. In Tampere they manufacture drill rigs for the mining industry and for surface drilling with one thousand employees.

Digitalisation and automation go ahead

It all started at the Subcontracting 2014 Trade Fair when the Sandvik sourcing people stepped into Darekon's booth. Interest in the versatile contract manufacturer sparked up and the first deals were agreed at the beginning of the following year.

Drill rigs have an increasing range of electronics and computer technology to steer and monitor the operation of the machine and its parts. The target of this technology is on the one hand to automate the operation of the machine and on the other hand to anticipate maintenance needs. The electronics are often moulded in resin because of the demanding circumstances in mining and

excavation. Darekon also manufactures sheet metal mechanics for many products to be used as a frame for the moulded part.

"Digitalisation, sensors and automation can be seen in our products and their development," says **Marko Roivas**, sourcing manager at Sandvik. "We have here a test mine with some four kilometres of tunnels. There we have a test track where we test completely autonomous – without any human – operated machines. In other machines the role of the operator gets smaller. Circumstances for the operators in the cockpits of the machines are comfortable but some machines are, however, remotely controlled and the operator sits comfortably in the office. All of this improves safety and efficiency and aims for better productivity."

Environment in the centre of development

EHS – Environment, Health, Safety – are one entirety for Sandvik and the actualisation is measured and monitored continuously. Energy use is always examined during development and alternative energy sources are assessed all the time.

Traditionally a drill rig in a mine is powered by a diesel engine. Now the first battery powered,

completely electric drill rigs are coming on the market.

“Our test mine is one thing we are very proud of here in Tampere,” continues Roivas. “It gives us really concrete surroundings to develop and test various new solutions. All drill rigs from the production line also go in the mine before delivery to customers. I believe none of our competitors have anything similar.”

Suitable and flexible supplier

“We have some 300 contract manufacturers that deliver thousands of products to us,” says Roivas. “This plant is an assembly factory and we don’t weld or mill here. All the components come here more or less completed and, for instance, the engine of a machine can be a complete power unit that is then mounted in the machine.”

“Our cooperation with Darekon has developed well. Their size as a contract manufacturer is good for us. The quality of the products is excellent, their ability to serve us is good and the operation is flexible. I think one can also see clearly that they are a family business – the client seems to come first, always.”

According to Roivas, Darekon manufactures practically all the firm’s subcontracted resin moulded connection and communication modules for a demanding environment. There are some tens of different products and production series range from tens to hundreds. Darekon



The operator’s “office” in a mine is safe and comfortable. Development, however, is towards remote control and autonomous operation.

also manufactures prototype boards for Sandvik’s R&D.

“I just talked with our designers,” continues Roivas. “Darekon delivers products for several research projects we have going on with them. They are digitalisation projects, mainly development of control systems and data collection. IoT is really essentially present in our development. Our designers say that Darekon’s willingness to serve and ability to answer questions is good. Quality is right and delivery times are kept. They are happy with the service they get from Darekon.” ■



Darekon’s service shows that they are a family business.”

Sandvik DD422i Axera is Sandvik’s first next generation mining jumbo that will show the way for the future of mining.





Automated component placement lines at work in the new part of Haapavesi's production facility. The layout is logical, there is plenty of space and room to grow.

◀ The component cassettes of placement machines are prepared in a spacey area right next to the component storage.

EVERYTHING IS READY THE PARTY CAN START

The expansion at Haapavesi facility is complete, production lines and all machines have found their new places and new equipment supplementing the entirety has been acquired and installed. Now there is space and capacity for almost anything!

Everything started at Haapavesi for Darekon and the facility has been expanded several times during its history of more than 30 years. The expansion newly completed is the biggest yet and the target has been to streamline production and increase the capacity of the plant.

Straightforward material streams

Automated component placement lines – the core equipment at an electronics manufacturing facility

– have been moved to the new part of the facility. It is much more spacey there and working around the lines is more fluent. In the long hall there is still plenty of space for growth if one, for instance, wished to add new component placement units or other machines.

In the old premises there is now plenty of space and manual production is concentrated there. One can flexibly set up assembly lines for new products as needed. Material storage is placed in the centre of production and preparing component



cassettes for the placement machines takes place in a roomy area next to the storage area.

The objective has been to clarify the whole layout of production and to make material streams as straight and short as possible. There is as little extra moving as possible and production advances from the end place of one production phase straight to the start of the next phase, without need for separate movement.

Many practical improvements

“We are very happy about the realisation of the expansion and the improvements and possibilities it has given us,” says **Antti Järviluoma**, plant director at Darekon’s Haapavesi facility. “The whole production is now more fluent and at the same time more peaceful. We wanted to invest in visibility, easiness, clarifying production phases and eliminating bottlenecks – and we have clearly succeeded in these objectives.”

“Technically the whole facility has been thoroughly renewed. Ventilation has been built again from scratch and it ensures both the wellbeing of

staff and the precise control of temperature and humidity required by production processes. There are fifteen energy wells, each 300 metres deep, drilled under the new part of the building and they conserve a lot of energy in cooling the facility.”

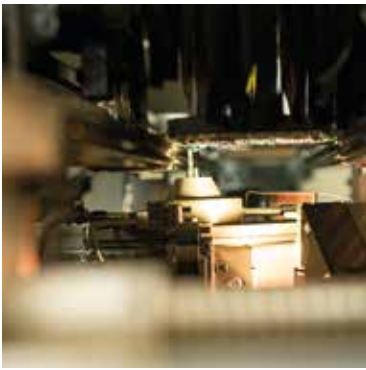
The building is connected to the district-heating network of Haapavesi city and energy wells warm up incoming ventilation when the weather is cold. The renewed ventilation is of course equipped with heat recovery from the exhaust air, so energy consumption for heating is now much lower than before.

Peaceful and quiet working environment

The large hall and the many mechanical production machines in it are bound to create some noise. At the beginning there were signs of this in Darekon’s new premises. Then there was a serious effort at noise abatement – both local attenuation and general sound isolation. Noisy machines, such as the nitrogen generator, are located in sound-proof rooms and much attention has been paid to acoustics as a whole.



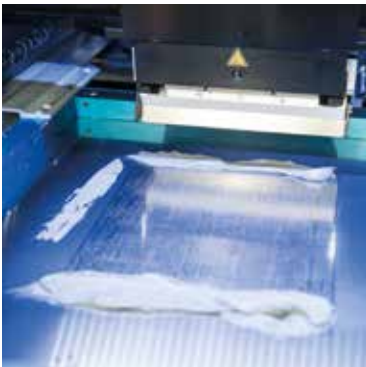
The whole production is more fluent and at the same time more peaceful.”



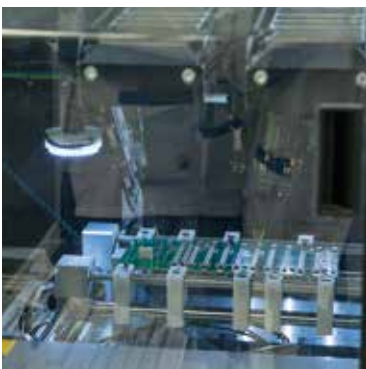
Selective soldering is well suited for use on connectors and many large components.



The thousands of titles for component storage can be found in their place on the warehouse shelves.



Soldering paste is printed through a stencil on solder pads on the boards.



The robot hands of the flying probe tester make one thousand tests a minute.



Manual production now has more space to set up assembly lines for new products as required.



The functional testing of completed boards has its own area, equipped with all necessary test instruments.

“Sound level in all spaces is now less than 80 decibels, that is considered the limit for the need to wear hearing protection,” says Järvioluoma. “In most spaces the sound level is much lower than that. For instance in the area for manual production it is quiet like in a felt boot factory and work, safety and comfort have been improved.”

Framework ready for growth

“The number of employees and the volume of sales are roughly at the same level as the last couple of years,” continues Järvioluoma. “We have now got almost 50 per cent more space and the renewals have made our production more fluent in many ways. Now we have excellent possibilities to respond to new demand and increase both the number of employees and capacity of production in all other ways.”

“We now have two automated component placement lines, both functioning in two shifts,” says Järvioluoma. “It is possible to increase capacity significantly by starting to use a third shift. For the time being we don’t need a third line and it is still possible to further increase the capacity of

existing lines by, for instance, adding new placement units.”

One significant investment just realised at Haapavesi is an AOI system that is an automated optical inspection system connected to the production line. The system is a 3D measuring system that makes a profile of the boards and examines component placement and soldering. With high-resolution cameras the system identifies moiré pattern created by light beams from various angles and out of this concludes if the soldered board is exactly as it should be.

The idea behind the investment in the AOI system is that there is a continuous stream of examined and flawless boards from the production line. This improves efficiency and quality – the human eye sometimes gets tired, but the machine doesn’t have bad days.

According to Järvioluoma, the strategy for Darekon is to proactively and in all ways ensure customer service, quality of operation and ability to deliver, before starting to sell more to clients. First the framework and then new deals. ■

UNDERSTANDING CLIENT'S NEEDS IS ALL IMPORTANT

With the completion of the Haapavesi facility expansion, Darekon has also strengthened its customer service. B.Sc. (Eng.) **Ilmari Haho** started as customer service manager in February. He wants to understand a client's production and development situation.

Ilmari Haho, living close to the city of Oulu, has a background in product development at Nokia and data communications. After 15 years the 54-year man moved to customer service in 2002 and has worked, amongst others, for Elektrobit, Innokas Medical and Ele-Products.

Situation and future

"We need to understand the state of a client's product development and product, what kind of service they need, and offer a solution to their real needs," says Haho. "At the de-

velopment stage the client needs prototypes quickly. If they are changing supplier, price and quality are the most important issues. In most cases quality is the reason for changing supplier and reliability of deliveries is an essential part of quality."

"My job is two-sided: to find new clients for whom our service concept would be optimal and to manage the arrangements for a group of existing clients. At one time I managed and sold product development so I believe I can well understand the client's needs regarding development,

manufacturing and economics as a whole."

"But how to get a new client to choose us? Even if machines, references and everything else is okay, it is people that make the contracts. Personal chemistry has to work too and create a confidential mutual understanding. The final decision is always based on personal service. I have even seen that a contact person has sometimes been changed if the chemistry has not worked."

Well-managed company

Haho has the experience of having worked with several electronics contract manufacturers and he has observed Darekon's operation for a long time from a competitor's point of view. For some reason Darekon grows and succeeds better than many other companies in the field.

He thinks Darekon's versatility is a natural reason for

success – different focuses of different manufacturing facilities form an entirety; good for serving the most varying needs of clients. Haapavesi makes top-level component placement, Savonranta versatile final assembly, Klaukkala mechanical parts and final assembly and Poland cable harnesses and long production series very economically. Darekon also wants to get to know its clients well and build a long lasting relationship with them.

Darekon is a well-managed company with a slightly different management culture than many others. According to Haho the production plants are relatively independent and operative management from the top management level is light. This low interference along with precise financial control keeps costs down so the company can be profitable, invest in modern production technology and grow. Behind everything there is the strong focus on quality and reliability of deliveries.

Ability based on experience

"Sometimes earlier I thought a contract manufacturer is a tail that the client wags," continues Haho. "But that is not at all the case. It is just here that there is a lot of professionalism. The well-rounded and expert personnel can solve many client's problems quickly and flexibly."

"In production they can switch project and client fluently and immediately observe the requirements and routines with new products. It is real professionalism that ensures easy, reliable and economically profitable cooperation for the client." ■



Ilmari Haho wants to understand both the production and development circumstances of the client.

Responsible business – sustainable development



Contract manufacturing of medical equipment and industrial electronics. Continuous development with the customer at the heart, digitalisation and sustainability are the signs on Darekon's road as a contract manufacturer.

Profitable growth for over 30 years has been possible because the customer has always been number one. Motivated staff, versatile services and comprehensive quality management system help us to operate economically, flexibly and proactively.

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