DAREKON.net

CUSTOMER MAGAZINE of DAREKON GROUP Ltd Autumn|2013

Communication

equipment for critical environments

Autumn | 2013

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We believe in ourselves, our customers and the future

Last year our turnover reached 33.5 million euros and operating profit was 2.2 million. Our growth therefore is moderate but clear and maintains profitability. We acquired our Savonranta plant in 2006, Klaukkala in 2009 and most recently Apelec Ltd at the end of 2012. These key years demonstrate our determination to develop through acquisitions alongside organic growth. This year we will also significantly expand our operation in Poland.

The acquisition of Apelec meant certain structural changes for us and the expansion of our service concept with the design know-how that came with the business. Further change was also apparent in the fact that Apelec's operation was integrated into our existing plants. Now Apelec's operations at its Malmi site have been relocated and almost all the staff moved to Klaukkala. The whole integration process has gone smoothly.

The expansion of our Polish manufacturing centre has been remarkable. There had been enough space to meet current production needs but not very much room for expansion. For some time we studied the options for expansion and last spring we encountered an opportunity that could not be neglected.

The result is that our new production premises are twice as large as the old. Now we can meet customer expectations even better than before since we have also invested heavily in production equipment for the new facility.

These expansions demonstrate that we trust in our customers, the future and ourselves. This is evident in our ability to grow, expand our services and maintain profitability in a generally lowered economic climate. In the future we want to serve our customers more comprehensively, from design to the end of life cycle of the completed products. Now we are in an even better position to do exactly that.

Kai Orpo

Darekon expands its service concept with an acquisition

The acquisition realised at the last shift of 2012 strengthens Darekon's services in the areas of design know-how, testing systems and productisation.

The negotiations started last autumn and quickly led to a positive result. On December 22 the documents for transferring all the stock of Helsinki-based Apelec Ltd from three private individuals to Darekon were signed. The acquired company employed 28 people and its turnover was 4.2 million euros. All the employees were offered jobs with Darekon.

On May 31 Apelec was merged with Darekon. Most of the electronics manufacturing was moved to Darekon's Haapavesi and Savonranta facilities. Assembly, together with product development, maintenance, logistics and product mastery was moved to Darekon's Klaukkala facility.

A brief history lesson

Pertti Mäkinen founded AP-Elektroniikka Ltd in 1994 to operate as a contract manufacturer for orders in the range from prototype-sized batches to medium large runs. He was previously a shareholder in Alektro Ltd and acquired its contract manufacturing operation as a basis for the new company. AP-Elektroniikka was renamed Apelec in 2007 as part of a company profile renewal and marketing plan.

The first years of the company up to the millennium were a time of strong growth in both turnover and personnel. Besides PCB assembly the product

portfolio included cable and module assemblies, protections, design services supporting production, prototype manufacturing and production documentation.

The shareholder base of the company was expanded at the end of the 1990s when Jari Hietala and Teppo Pitkänen became shareholders alongside Mäkinen. All three men have moved over as employees of Darekon. In the early years of the new millennium AP-Elektroniikka's strategy was to become a comprehensive product supplier offering all the steps in electronics production from design to manufacturing, installation and maintenance.

Darekon gained more resources

"The strategy of Darekon is to continue growth both organically and with acquisitions," says Kai Orpo, managing director of Darekon Group. "We are always alert and ready to grab the opportunity. With Apelec the period from opening the discussion to reaching a decision was exceptionally short since many details were apt and we could see that the firm's values correlated with our objectives."

Orpo continues: "The company had grown to a turnover of more than four million and with an operating profit of 400,000 euros it was a healthy and operational company. They also had very good clients and there were possibilities and even needs from the clients for growth. However, growth would have required very heavy investment so they started looking for a bigger partner for further development of the operation."

Darekon needed more resources so the new and professional personnel were welcome. Almost all the people employed by Apelec moved to Darekon's Klaukkala facility as employees of Darekon. According to Orpo, the major value of the merger was an expansion of the service concept – design know-how, good assembly ability and know-how of productisation and testing.

"I believe everybody wins in this arrangement," adds Orpo. "The merged company got the 'back rest' to continue developing the operation, Darekon got additional resources and clients got an even stronger partner to safely expand and deepen their cooperation with."

Matching clients' requirements

"We have always tried to operate service first, identifying and sensitively reacting to customer needs," explains Pertti Mäkinen. "Our strengths are design know-how, productisation and managing product change. The manufacturing service is of course essential and with that we want to be a partner to our clients, listen carefully to their needs and react proactively. Our maintenance service includes installation, measurement, calibration, quality issues, reporting and upkeep of testers and measuring equipment. We have especially aimed at developing testers."

As an example Mäkinen relates a comment from one customer: "Of course everybody says they are a partner for the customer, but you really are that!"

"When manufacturing products every now and then there arises a need to do things in a new way," continues Mäkinen. "We have had the courage to take up the issue and customers have liked that. We have sold the design work and any changes as a separate service and not hidden any inappropriate expenses in the product price."

Apelec was very small compared to its clients but the firm always tried to get to know the operating culture of the big companies it served and act accordingly. Mastering product upkeep outsourcing and SAP environment for instance have made this approach easier. Darekon has traditionally mastered the operating culture of its clients and now both sets of experience strengthen each other.

All of Apelec's three shareholders have been developing customer interface and understanding of it. For the last decade Mäkinen has used roughly half of his working time for developing ERP. He explains that even difficult customer arrangements can be made profitable – the problems are not necessarily as big as they seem at the beginning of a relationship.

More certain future with acquisition

"Two of our biggest clients were approximately one quarter and one third of our turnover and they had a need to expand our cooperation. A single client growing too dominant would have been a risk for both," says Mäkinen, explaining the background for the acquisition. "We had a definite pressure for growth but it would have also required huge investment. Because of this pressure from the clients we started to look for cooperation with a suitable partner. We did not want to 'butcher' the company and quit but to find the best way to continue and further develop the operation."

"With Darekon we found an ideal partner. The very first contact was very positive and we found that our values were similar. We had thought over the issue very thoroughly so the negotiations moved forward rapidly. We had been a very tight group of people. For a while the idea of selling the company was painful but very soon everybody understood that it was actually a great and positive opportunity. One of our SMD operators moved to Haapavesi since he was born nearby. Another took up peacekeeping according to prior plans. One employee retired and just one quit because of a difficult commute. All the rest are now in Klaukkala."

"We can already see the benefits of the acquisition with an interchange of our abilities," estimates Mäkinen. "There are far more regulations in the area of medical equipment than we have experienced elsewhere. On the industrial side flexibility and revisions are very quick and that is what we have always been good at. Combining these abilities – flexibility and operating with exacting regulations – gives a good result."

"After moving to Klaukkala we have had a very positive reception and 'carte blanche'. Pekka Antikainen, Darekon's plant manager at Klaukkala, has been very open and given us his full support: 'Tell me what you want and we will help you.' The feedback from clients has also been positive. A buyer from a big client said: 'I am happy that we have not seen any change'," grins Mäkinen.

Testing can lead to profits at every stage of the product life cycle

Darekon's test tower is a compact system that includes all the necessary devices.

Through a recent acquisition Darekon has gained testing expertise and a well-developed modular testing system.

Testing is necessary not only at the product development and production stage but also at the later part of a product life cycle, when it can have a surprisingly big impact. Having a standardised test system can prolong a product's life cycle for years.

Computers change too rapidly

We all know what it is like testing prototypes: a big bunch of power supplies, generators, analysers and interfaces collected on a table and everything connected to a computer for storing and further analysing the data. There is a good mess of cables and of course the set-up is unique to the product being tested. For the next testing sequence the whole set-up has to be reassembled since between tests the equipment is inevitably needed somewhere else.

It often happens that when you set up to test a new production batch you find the product is not working. What has gone wrong? Are the new products really only good for scrap? Then you dig up the golden sample and find out there is something wrong in the test set-up, often with the computer. The true problem is that the life of a computer is so hectic. The serial port has been changed to USB, USB is no longer at the same COM address as in the previous computer and so on. There is simply too much automation in the operating system.

The starting point for developing Darekon's testing system was to "freeze the hardware", i.e. using a tester that always has the same basic structure. A tower with wheels was equipped with a light standard set-up – a power supply, a computer, an oscilloscope and other measuring devices together with an interface for product specific adapters. The idea was that one did not need to know in advance what product would be tested.

Modular adaptation and software

The test tower has a connection dock for product specific adapters – cassettes – that can be changed with the quick flip of a hand. The cassette may have integrated product specific characteristics but can be low cost, production costs starting from a couple of thousand euros.

The software used in the tester is also developed in a modular style. All the drivers are there in the many modules needed for testing. To build a test program for a new piece of equipment is like assembling a small puzzle that will take care of all the necessary procedures.

"The adaptation cost must be so low that the testing set-up can be built at prototype or – at the latest – pre production stage," says Pertti Mäkinen, project manager for Darekon. He has had a key role from the beginning in developing the test tower. "This way there is the possibility of getting much more information on the product during pre-production, so we can complete the product faster and with lower costs. Once the product is otherwise complete, there is no further boundary for arranging testing."

"Products manufactured in our factories go – in practice – through 100 per cent functional testing. If a product is manufactured, say for example at a rate of 10,000 pieces every day, maybe 10 per cent testing is sufficient. With small series production, when products are manufactured only a few batches a year, the importance of testing is much higher. Assembling a test set-up and testing even a small batch of product is really fast and reliable using this test tower. And the core of the tester is not 'just any' similar computer but always the same physical machine."

"I want to think this as widely as possible," stresses Mäkinen. "When we produce a product we are responsible to the customer that it works. Making the product in a documented way is only part of the completion. If we deliver bad products to the world it is not about whom to blame but about the damage caused. This is very closely related to product development. We have to understand the needs of the customer and fulfill them as well as possible."

Value with testing of EOL products

Industry often uses products that are unchanged in their production for many years. For example, the product does its job as a part of some heavy machinery and there is no need to change it. A breakdown and change of test equip-

Pertti Mäkinen demonstrates the test tower: the board to be tested is placed on the needle bed and the cover is closed. The adapter cassette and modular test program are product specific, everything else is standard.

ment can all of a sudden turn a product like this into an end-of-life product. Circumstances have changed and perhaps something essential for repairing the test equipment is missing. It may be an old item of measuring equipment or maybe an NT computer – parts or documents for which no longer exist.

With many machines there is an agreement that spare parts will be available for a decade or even longer. Those parts will have to be manufactured and tested. You can face unexpected problems if the test system becomes outdated.

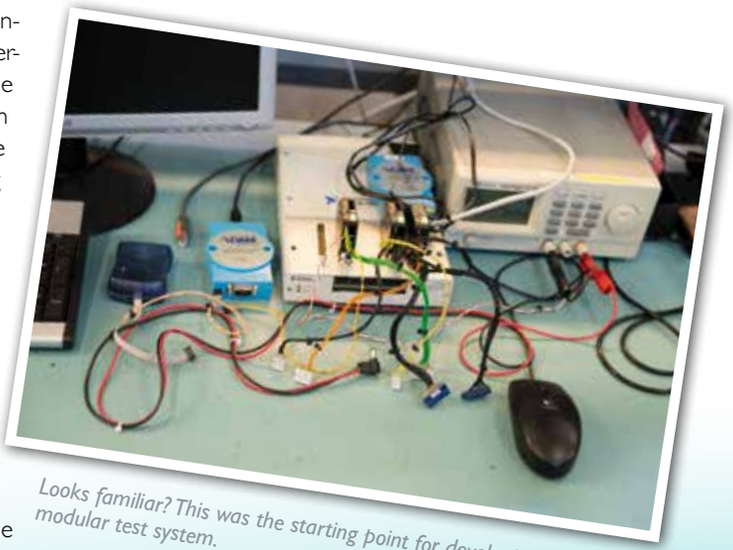
"With EOL products the whole testing procedure will have to be thought out again," continues Mäkinen. "We must start with the testing needs of the product, what needs to be tested and why. Old test specifications must be updated and a new set-up based on them built. The adapter can, for instance, include simulation if one needs the characteristics of outdated measuring equipment. With modular adaptation and software it is possible to achieve large – up to ten times – savings."

It is often the case that some completely functional component in a product must be changed because the availability or production of the component has come to an end. Estimating the consequences of the change is always critical. When an engineer designs and tests it, the product may operate with the new component. A proper test set-up makes it possible to much more precisely measure and analyse the consequences of the change. If the tolerance is very close to the limit, a couple of extra measurements may confirm functionality. Testing can also estimate possible problems with manufacturing through the creation of SPC data.

The tower is not made to be sold

"The test tower is not designed to be sold – but the service offered with it," says Mäkinen. "However, some clients have asked if they could have one and it is not completely impossible. The basic idea is that we have a couple of these in the production stage and maybe only one at development."

"The essential thing is similar testing time after time: pre-series is manufactured for market study purposes. It will have to be produced as closely as possible to the way in which the production series is made afterwards. That requires a documented, repeatable test environment. Then the result is a sellable product."



Looks familiar? This was the starting point for developing the modular test system.

Better and more economical manufacturing with productisation

Darekon offers its clients productisation planning with the main focus on developing better manufacturing. Through Darekon's experience it has become quite clear that cooperation started at prototype phase results in a better and more economical product that can be put on the market sooner..

One version of the inverter demonstration unit is this device with simulated motor and inverter power electronics. Real technology is represented only by the inverter steering card and user panel that steers the simulator, functioning like a real combination of a motor and an inverter.

Productisation as a phrase has a number of meanings of course. With Darekon productisation services do not include consideration of whether there is a need or market for a product, nor of its intended purpose or the competitive situation.

The whole lifecycle from prototype

Productisation with Darekon concentrates on designing a product that is as economical and easy to manufacture as possible. When a client opens the discussion at the prototype phase, he will get feedback regarding manufacturing as early as possible. That makes it possible to prepare to source the materials that may be needed and also consider what alternatives are available. If the new product has many and/or critical components, it is essential to confirm the availability of the necessary material.

It is important that the contract manufacturer is involved from the beginning as their job often includes sourcing the components required for the prototype. In such a case there are no further delays in the ramp-up phase. The manufacturer will see the whole life cycle of the product and roles can be specified as early as possible. That may include mechanical design, choosing of materials, packaging design and planning of logistics.

Everything specified

"Sometimes a client under pressure may need to concentrate on the core product to such an extent that some detailed issues connected to the creation of the product may be left on the backburner and delayed," says Pertti Mäkinen, product manager of Darekon. "We can find out the discontinuities, create method planning and plan the production and testing instructions with sufficient accuracy and purpose. Planning testing is one essential part of a product, very few products can be manufactured without testing."

"Sourcing responsibility and ways of acquiring the key components must be specified, schedules too and organising of pre-series and pilots must be detailed. It just does not work smoothly if everything is not specified. Schedules can be ambitious and may have to be surrendered at some point. It is important to work this out together in advance."

"The essential thing is to contact the contract manufacturer in good time, not only when putting out tenders," emphasises Mäkinen. "We then have the ability to plan the best production process in advance, and contacting us does not mean binding oneself to our manufacturing services. Our design service is a separate service, invoiced separately. The manufacturing price is kept clean of expenses that don't belong there."

Productisation leads to profits

Our customers' engineers and industrial designers think about functionality, appearance, installation and electronics design. The designers of Darekon can concentrate on mechanical design, structural parts and their compatibility with customer specifications. One service we include is that the design results will be handed over to the customer in their specified format.

Documentation is essential, for instance, for keeping track of changes. If a fixing eyelet needs to be moved, documents in the right format can be taken forward directly to quickly make sure that the change is functional and can be introduced.

"Good productisation increases the possibility of trouble-free and economical production," says Mäkinen. "The product will be sooner in manufacturing and there will be less early stage changes. Making things again always increases costs so the result is a better product that can be efficiently managed. This means better profitability."

Pertti Mäkinen shows an inverter demonstration unit equipped with a motor, brake and an inverter steering the motor. The product has gone through many iterations over the years.

Renovation
at Klaukkala

After the acquisition of Apelec at the end of 2012 almost all the employees of the company moved to the Darekon facility at Klaukkala. One plating line relinquished some space and shelving was moved as construction workers drilled and crafted. Some paint on top and excellent premises were ready for the new employees.

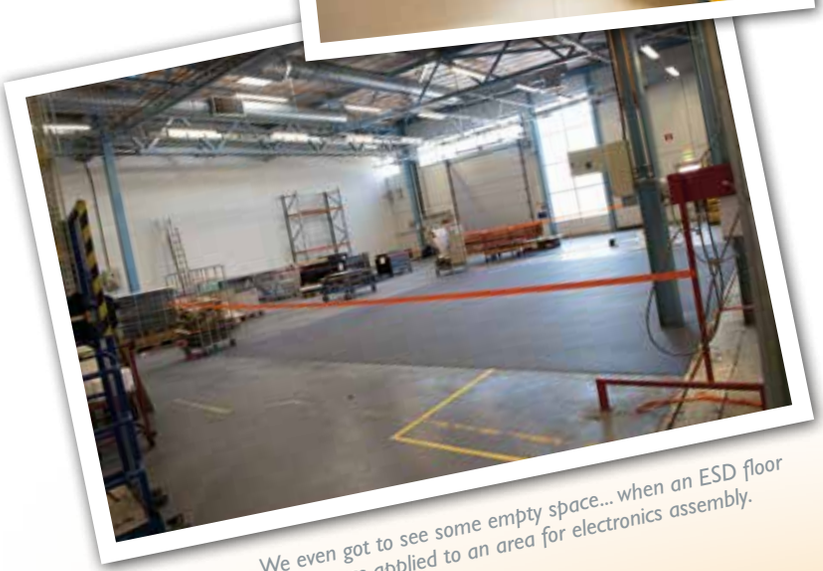
Up with the beams, some wool and plates. The new walls went up very fast.

"It is going to go here," plant manager Pekka Antikainen seems to be thinking in the middle of a multitude of stuff to be moved.

Sometimes the construction men had to stretch a bit lower...

...sometimes they measured and fitted plates in place just below the roof.

This motorgun shoots screws almost as fast as "Old Emma" used to.



We even got to see some empty space... when an ESD floor coating was applied to an area for electronics assembly.

Savox Communications
is a demanding customer of Darekon

Savox Communications is a top global high-tech company manufacturing communications equipment and systems for team communications in critical environments. Darekon is a strategic partner in manufacturing their electronics.

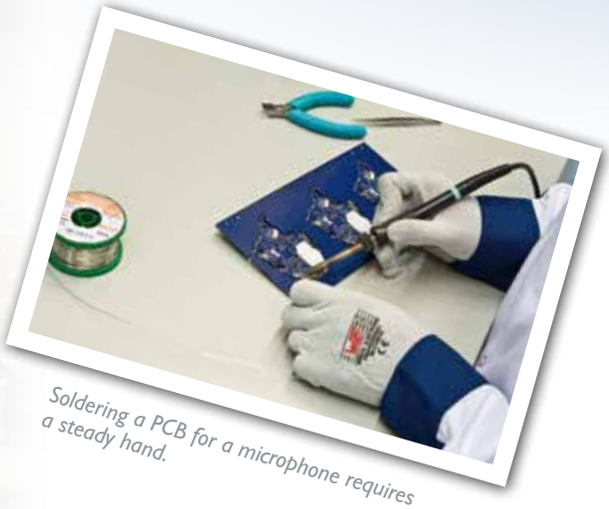
It is not many Finnish family-owned companies that have been able to specialise so deeply and yet broaden so widely internationally. Savox has expanded through several acquisitions and operates on most continents. Simply put, one might say that the company's products are mainly handsets for firefighter's and soldier's radio systems. The reality is much more complicated of course.

Finland's growing importance

Savox's headquarters is in Luxemburg; administration, R&D and product management in Finland, in Espoo; and the firm's manufacturing facility is in Savonlinna. Other production sites are in Vancouver Canada, Lincoln USA, two engineering and sales sites in the UK and a 100 people factory in China. There are also sales offices in Frankfurt and Paris. The group's revenue is about 25 million euros. The good thing for Finland is that the importance of Savonlinna's production work is growing.

Savox products are used for transmitting critical messages in critical situations. A well-described example of its customers is the Alaska fire brigade that has to put out fires in minus 40 degree centigrade (-40°F). Both men and equipment require exceptional endurance.

Speech has traditionally been and still is the most important way of team



Soldering a PCB for a microphone requires a steady hand.

OMD testing makes sure that the components fill the required specifications.

Jigs and other necessary ancillaries are made by Savox in its own workshop.

communications when operating in fire, rescue tasks and combat situations. However, the importance of data is growing all the time. For example, the need to transmit situational information is growing all the time and Savox is a strong forerunner in this development.

One part of the firm's business are products related to rescue operations, developed in their Canadian centre. Among the products are sensors for locating trapped earthquake survivors who are signalling for help by knocking. Rescuers can then push a camera through a drill hole to observe and record the situation. It was these devices that were used in the Chile mine accident in 2010 to communicate with the trapped miners.

A small start

"Our founder used to work at the AGA radiotelephone unit and later at Sonab. Acquainted with communication equipment for fire and rescue services, he founded his own engineering bureau around 1982. Later on he sold his company to our current owners. Sweden was our most important market at the beginning and we still have a 99 per cent market share with our branch there," says Henrik Aure, vice-president of Savox Communications, who joined the company in 1986.

"Our operation started literally in a garage and gradually started growing. In 1986 we started to have products made by the Savonlinna-based contract manufacturing company owned by Kari Makkonen. His company was merged with Savox in 2000 and Kari became the plant manager. After that we started cooperation with Savonranta-based ET-Electro, which Darekon later acquired. At that time we figured that our production quantity was not sufficient to purchase our own SMD line and we started using the Savonranta plant for assembling and testing PCBs."

During the years the cooperation has developed and deepened in many ways. At regular intervals Savox has load peaks in production and Darekon helps in assembly. The big clients of Savox have also audited Darekon's facility for the ATEX standard, applied in potentially explosive atmospheres. Darekon takes care of the traceability of components down to production batches, as required by the standard.

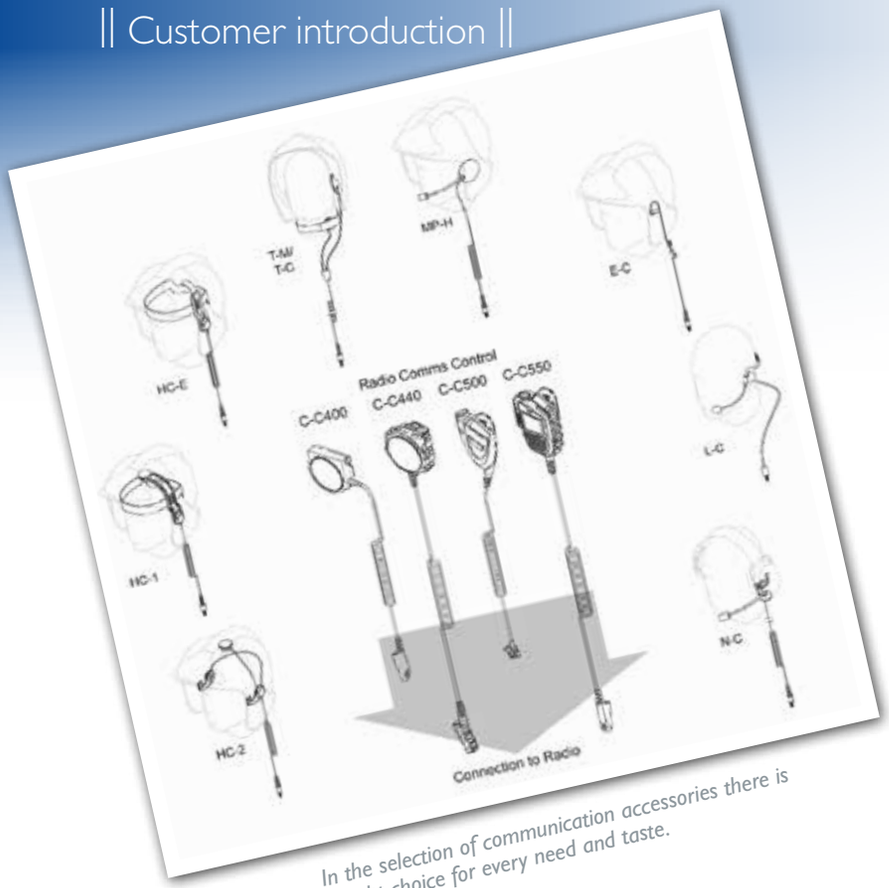
The products must work

Quality is a crucial factor in the firm's products, according to Aure. The circumstances in which they are used are very demanding and often it can be a question of human lives. Investment in R&D is very high since Savox wants to be continuously at the peak of technology development. Investments in ATEX products, for instance, are strong and Savox has gained a lot of experience and know-how on the subject. Flexibility and productivity must be maintained because these factors are valued by the firm's major customers. At the same time the company must also stay ahead in technology and introduce new products such as the IP Intercom and Push-over-Cellular systems. Basic products are still a major part of the business but change is happening.

"The investment by defence forces of large countries are several million euro projects even in a specialised area like this," continues Aure. "As an example of quality I can tell you about two large integrators of military technology – one of them with a turnover of 32 billion USD – who made a visit and audited us and Darekon. As a whole, our quality was above their requirements. One of them had cooperated with our UK facility and there was a small threat in the air about losing them as a customer. When we transferred the production to Savonlinna, they started expanding cooperation soon after the audit visit."

Savox's premises in Savonlinna are at the Elektronia Technology centre. A big advantage of the location is, says Aure, the educational facility that is kept up by the community operating in the technology centre. Savox has a lot of cooperation with the facility in the area of quality assurance because they have a.o. an X-ray inspection systems together with environmental testing systems for electronic, mechanical and external circumstances.

"One must salute the city of Savonlinna, this has been of very valuable help to us," praises Aure.



In the selection of communication accessories there is a right choice for every need and taste.

A turning point in technology

Life cycles of critical communications equipment are very long. A 10 to 15 year life is not exceptional and there are devices in use that are exactly similar to those used in 1985. But now there is a turning point at hand. A change from analogue to digital technology is taking place – though much later than with commercial equipment.

"Peripherals used to be analogue and the change to digital opens many new and broad development possibilities," says Jerry Kettunen, president of Savox Communications. "Understanding the circumstances and customer needs have, however, not disappeared. In the mature large markets – such as the USA – the walkie-talkie has always been widely used and still is in industry, logistics and retail business besides emergency services."

"Push-over-Cellular – PoC – is one interesting new technology using the normal cellular phone network and often normal cellphones. For demanding environments rugged phones made by – for instance – Sonim are used. The phone is equipped with Savox peripherals and special software. With the system the user can contact a specified group just by pushing the tangent, without dialing any numbers, just like with an ordinary walkie-talkie. The difference however is that the speakers may be at different sides of the continent. Transportation company FedEx is one of the wide deployers of this technology."

IP Mobile Platform Intercom is another system using new technology that Kettunen mentions. With this technology the crew of a vehicle or vessel can be given the situation description with a flexible modular system. Besides internal calls everybody has access to various radios by which speech and data can be transferred. One of the vessels being equipped with this system is the new offshore patrol vessel Turva, the flagship of the Finnish Border Guard, being built at STX Rauma shipyard. Several other smaller vessels of the Coast Guard are already using the system.

Close Darekon cooperation

"Moving our testing of PCBs to Darekon has been one big step in deepening our cooperation," continues Kettunen. "The standards require traceability down to component level. Darekon takes care of that and we follow only complete PCBs. Darekon is also closely involved in manufacturing prototypes. These are small separate things with a wide entirety. This is not just a trade relationship but a true partnership."

"We want to centralise manufacturing in Savonlinna and Darekon manufactures the electronics. If we have some problems, if we have changes or if an existing product of a client needs to be renewed – everything is easy with Darekon. Sometimes exceptional flexibility is needed, when the timetables require working during evenings, nights or weekends. Even in these cases Darekon has helped us and we value that greatly."

As one example of close cooperation Kettunen mentions PoC devices that were put under development at the end of January. "The amount of work and the available time were not in quite a proper relation, but somehow we managed to complete them – half a year from start of development to completed products. Sometimes we had to work late nights and the last products were packed one hour before the deadline. We are very proud of the success of this project."

Appropriate design, durability and safety are the key properties of Savox products.

Darekon produces
Savox boards every day

Savox Communications is a long term client of Darekon's Savonranta plant. During the years the partnership has become wider and deeper. At the same time the requirements and challenges of production have increased constantly.

The Savox product range is broad and that means a large volume of various PCBs needs to be produced. There are also numerous versions of many of the boards. Most of the boards are used in demanding circumstances that require selective coating and component traceability.

Making things easy for the client

"If we want things to go smoothly, we have to have a very close relationship with the client," says Kimmo Turtiainen, Darekon's Savonranta plant manager. "With Savox we have a long history together. It is easy to work with them since we understand each other and 'speak the same language'. In demanding situations – such as a problem with component availability – we can get help immediately from the client."

"After soldering, the Savox boards are examined visually, then tested electronically, washed, in most cases coated selectively, examined visually again and finally packed. Devices classified for a potentially explosive atmosphere require traceability down to individual component level. For this we have built a very well functioning system that has been running effectively for more than 10 years. The products that come under medical classification also require the same traceability."

Savox projects often have a very short delivery time and according to Turtiainen it helps that various plans of action are familiar to both parties. Darekon also maintains a selection of basic components for Savox since the products have been in production for such a long time. Only some of the components for new projects have to be sourced separately.

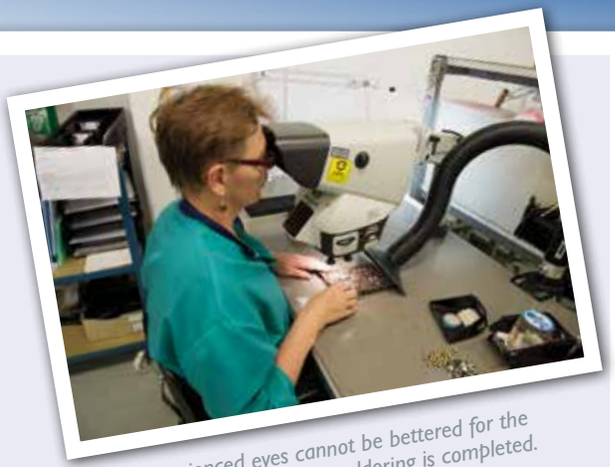
Accurate production with multilayer boards

You would think that a speaker microphone is a simple product but today almost every device has a microprocessor controlling its functions together with complicated electronics. Resistors and capacitors often measure 1.02 x 0.51mm (0.04 x 0.02in.), all components including connectors are surface mounted and numerous via holes on multilayer boards are hidden between internal layers of the board. These kind of via holes are made by laser, with very high positioning accuracy.

Solder paste is applied to the board through a stencil and then components are placed and soldered in a reflow oven. Inspections are carried out next. The requirements for accuracy are high as the component raster may be only 0.5mm and solder pads less than 0.3mm. Such accurate work is successful because the positioning accuracy of placement machines is now one or two decades ahead and solder paste ball size is 20µm.

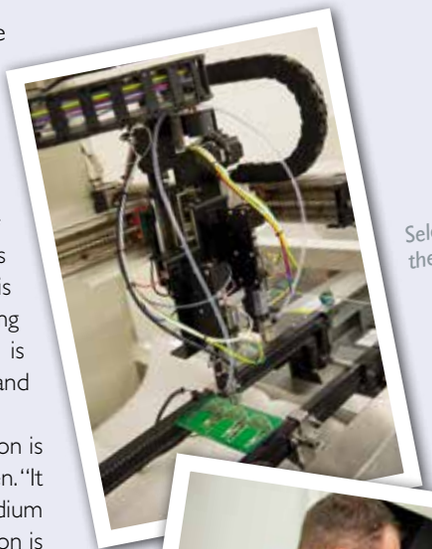
"At our plant the visual inspection is made by people," explains Turtiainen. "It is the best way with small and medium large production runs. Machine vision is not a solution, it only does what it is programmed to do. It is better to have several people who change tasks at regular intervals. However, it is crucial to make the process so good that it functions without problems."

"We have close cooperation with both Savox's Savonlinna plant and its Espoo R&D office. Everybody has a common target of supplying the end users," adds Turtiainen.



Experienced eyes cannot be bettered for the visual inspection after soldering is completed.

Electronic testing makes sure that everything functions as it is supposed to.



Selective coating protects the board from humidity.

After coating visual inspection in UV light confirms the flawlessness of the coating.

Meriläinen and Pulkkinen — on board from the beginning

Employees seem to get along at Darekon, as do Haapavesi's plant manager Eero Meriläinen and materials manager Juha Pulkkinen.

Every issue of the Darekon.net magazine features a story about a long time employee in a central position. This time we are featuring two key staff in one go. The jobs of the two men are so intertwined that it appeared to be the obvious approach to take.

Third employee of the company

In between his studies Juha Pulkkinen worked the summers at Nokia. In 1985 there was a recession and when Juha asked for a job for the Christmas holidays, the answer was negative. A decision had been made not to hire any more trainees.

Aarne Soikkeli was the vice-president of Darekon – founded in August 1985 – and Juha happened to have a chat with him. Aarne suggested that he should "come with me to Haapavesi". Why not? was Juha's response, who jumped aboard as Darekon's third employee. The premises were in the basement of a community house as the

manufacturing site was still under construction at the time.

"I worked there for the whole Christmas holiday but I had no plans to stay any longer," says Juha. "An electronics training course for educating employees had just started and I purchased the hand tools needed for the training. We were also looking for a leader for the course and one day Eero came for an interview. Managing director Kyösti Halonen spent a lot of time in Moscow so it was down to me to interview Eero."

When he arrived in Haapavesi, Halonen asked who would be a suitable leader for the course. Juha suggested Eero, who had worked for some years at Mobira in Salo and was born in Kajaani. He was hired and Eero in Salo packed all his belongings in his Opel Kadett and turned it northwards at the beginning of 1986.

Eero started his role leading the training and Juha returned to study. After graduating in the spring of 1987 he came to Darekon as a permanent employee.

Projects and contract manufacturing

In the autumn of 1986 the manufacturing facility produced so many displays for the Soviet Union that it was filled with the necessary material. At the end of the year the displays were delivered and then the 25 employees of the company had nothing to do. "The girls knitted socks on full salary but Heikki Orpo did not lay off anybody, even temporarily," remembers Eero.

Right at the beginning of the next year they started getting subcontract jobs and soon subcontracting and projects obtained by the trading department – led by Halonen – were complementing each other. At the beginning of the 1990s the Soviet trade finished when the Soviet Union collapsed. After that the company concentrated on contract manufacturing.

The men recall how in those years Kai Orpo became managing director in 1990, contract manufacturing for Fiskars Power Systems led to setting up the Polish factory in 1991 and Darepro was founded in 1993.

The following couple of decades have, according to a smiling Eero and Juha, been as successful even if the business has changed a lot during that time. "A couple of expansions and a couple of company acquisitions along the way yet quite a few of the original clients are still with us. During that time the volume of contract manufacturing increased from 300,000 Finnish marks to 33.5 million euros."

A jointly run plant is a thriving plant

After joining the company at the beginning of 1986, Eero first trained the staff and then started taking care of the production, first as foreman and later as production manager. He was appointed plant manager at the beginning of the 1990s.

"I had worked at Mobira in Salo for a few years but then moved here for a more secure livelihood," laughs Eero.

Juha, for his part started as a buyer in the company in 1987 and his title has been changed to materials manager on the way. There are now six to seven buyers in his team.

"Tools for production, chemicals, stencils, tin, gloves and everything else is a lot to organise besides sourcing components," says Juha. "Also expense calculations have a central role and a tight connection to calculating offers. That ensures profitability."

"Together with Eero we are both responsible for the operation to its owners. When we invest in something we must both more or less agree. And when the yearly financial statement becomes ready, we can both tell if there will still be a job for us the next morning," grins Juha.

"We cooperate pretty tightly and we have carried the responsibility together – with everybody else in the company of course. Eero has strong nerves so being the plant manager with all the personnel issues that entails is ideal for him. And maybe I manage better with the English speaking suppliers. Maybe our jobs have recently diverged a little. In the 1990s and beginning of the 2000s we worked really closely. In Finnish we have a saying: 'like shirt and trousers'!" says Juha wryly.

More rush and more services

The two men may say that the last couple of decades have been the same business but they certainly agree that the need to work fast is increasing all the time. The selection of services has expanded and all delivery times have been tightened to the limit – except delivery times for components.

Electronic communication methods have on their part increased the work-

Juha and Eero got excited recalling the past and they found many interesting photos hidden in their archives. A couple of samples are featured on the next page.

ing pace. "The delivery must come quickly, quickly – can we have it next week?" they relate. Long term planning has changed to living hand-to-mouth. Smaller clients may only have a basic idea of their production needs but they want to all happen very quickly.

On the other hand the component manufacturers have become much more willing to close their production plants when the demand decreases; and they don't open again as quickly as previously. So delivery times get longer and it becomes more difficult to estimate prices. If a facility somewhere burns down or even if there is just some rumour going round, everything on the market is bought out even if there is no need for it.

Memories and other components that get outdated quickly can be discontinued sooner than before. This creates problems for products with a long life cycle as the structure of the product will have to be changed because some component is no longer available.

"Electronics will be manufactured in Finland in the future," the two men are sure. "Many clients have already brought back manufacturing from China for instance because of quality issues and high transportation costs. In the future more and more different devices will be manufactured and somebody has to make them. The number of clients and the share of smaller clients increase."

"Of course it may be that we have to get acquainted with some completely new technology, as printed electronics and three dimensional printing is being talked about so much at the moment," sigh the men.

The big commute

Eero lives in Kajaani and the distace to work is 130km (80 miles). Juha lives in Oulu and the distance is also 130km. Sometimes the distance can feel long, sometimes not. When Eero's children were small he lived in Haapavesi but his wife's job in Kajaani took them back there.

Both men are married to their first wives. Eero has a daughter and a son, Juha has five daughters, the youngest twins still living at home. Eero delivers his words in a thoughtful, peaceful manner and describes himself as persistent and determined. Juha is a little more bustling and has a good sense of humour but is equally determined.

Outside of work Eero takes time to stay fit, is in charge of the home DIY and visits his country cottage, known as mökki in Finnish. Juha plays football in a league and amateur ice hockey. He has accumulated quite a few football medals. Juha also does the DIY and gets more exercise with his dog.

A long career in one company

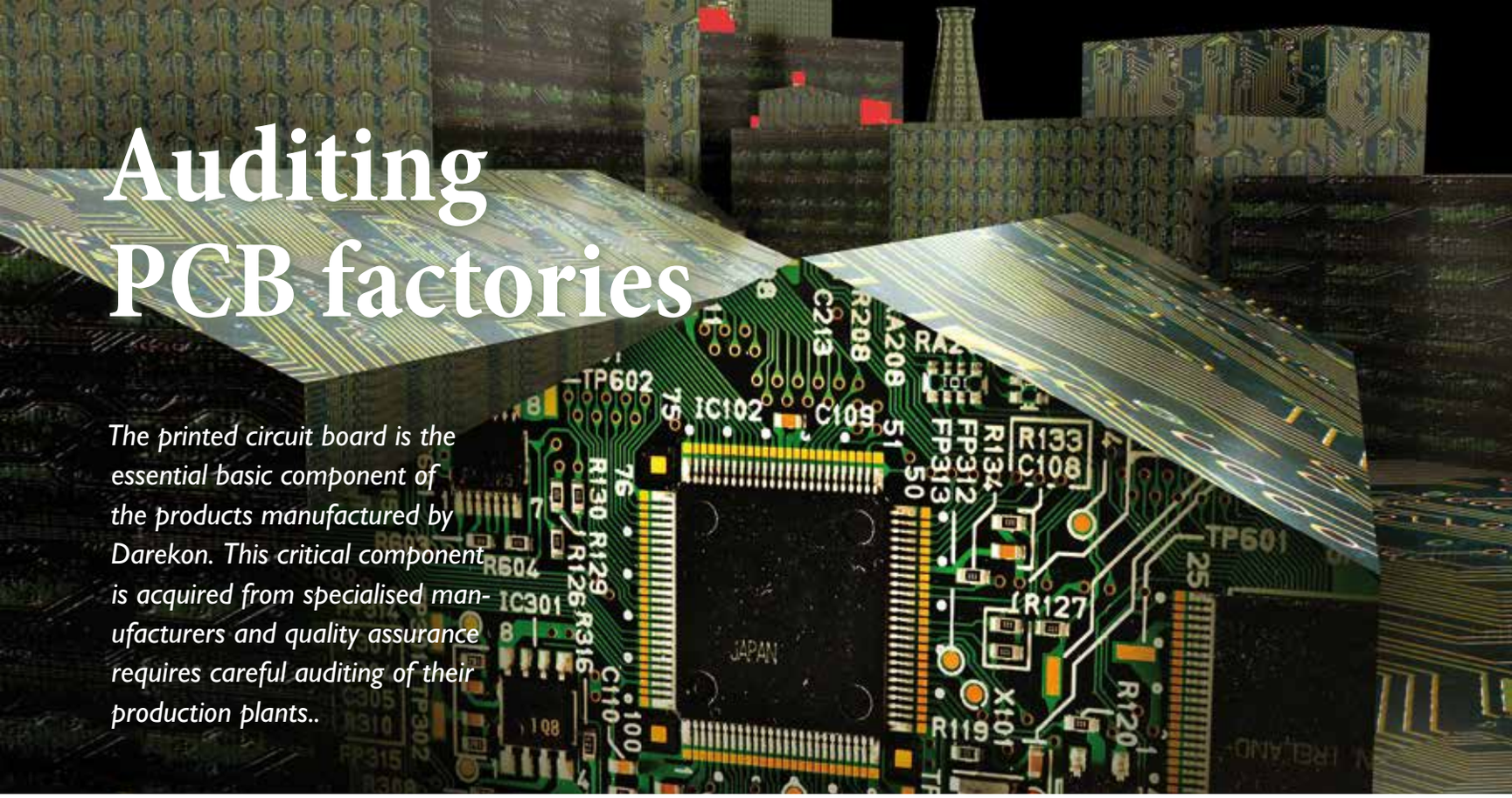
At the beginning Juha did not think he would stay longer with the firm than that Christmas holiday period many years back and Eero planned to stay for only a few years. Their stories unfolded differently. Both have witnessed Darekon's journey from a company with just a few people to its current size of almost 300 people. And for their part, they have been influential in that development.

"The work is interesting and you feel independent to carry out your job," both agree. "We are a solid part of the company. The atmosphere at Darekon is very good. Almost all the managers have stayed in the company permanently and staff turnover is very small. Sometimes there have been temptations and sometimes head hunters have called. However, we have not felt that any other job could be better than this one. This company is successful in spite of the big changes in our industry. Everything is well."

In 1988 there was no computer on the desk of the production manager. There was plenty of paper though.

A young materials manager in 1989. Juha has hardly changed at all during the years.

Auditing PCB factories



The printed circuit board is the essential basic component of the products manufactured by Darekon. This critical component is acquired from specialised manufacturers and quality assurance requires careful auditing of their production plants..

Materials manager Juha Pulkkinen and quality manager Jari Aspegrén have just recently returned from China where they were inspecting PCB production facilities. Out of the PCBs used by Darekon some 70 per cent are manufactured in China and auditing visits are a regular part of that cooperation. The remaining 30 per cent comes from Europe, with around one third of that from Finland. The share from China is still growing.

Large and specialised

"The dimensions are completely different to Finland," says Pulkkinen. "If a PCB manufacturer in Finland has six drills, in China they may have one thousand drills with six chucks each. Just in the office there are 400 people working and in the factory 8,000. This kind of production plant may specialise, for instance, in more than 10-layer boards with hidden via holes and aluminium based multilayer HDI boards."

"The factories are new, less than 10 years old and the know-how is high. Company structures are, however, complicated and variation in quality may be big and occur fast. A facility may operate inside another facility and some steps of the production may be subcontracted out. Factories may also appear and disappear quickly and the fast replacement of employees is quite normal."

A two man patrol

The basics of production are documents and work instruction according to quality systems. Aspegrén sends the companies that are to be audited a pre-audit questionnaire before a visit. The answers can be very variable. During the visit the division of work is generally that Aspegrén goes through the documents, their ways of working and the whole "official" discussions with the representatives of the plant. Pulkkinen looks around, asks all kinds of questions and tries to form an understanding of the practical operation and possible aberrations to what is documented.

"In China you must not be credulous," stresses Pulkkinen. "Any document at all can be purchased there and in the end money is the only thing that matters. Cooperation with the Chinese, however, works and they deliver good products when one shows that you can master things. Requirements must be strict and one must watch carefully that they are met. You have to respond to possible mistakes immediately."

A growing Special Economic Zone

The recent auditing trip was aimed at the Shenzhen area, a fast growing city located immediately north of Hong Kong. Thirty years ago it was a fishing village of 8,000 people and now maybe 20 million people live there and each month some 200,000 migrant workers arrive.

Typical in a free trade area, the staff live near the production plants in small flats. The manufacturing facilities are often fenced campuses containing all the services employees would need. For instance "Foxconn City" covers an area of three square kilometres (1.2 sq miles) and there are maybe 300,000 to 400,000 people working there.

Small and large PCBs

"An auditing trip to China is always an experience," thinks Pulkkinen. "This time I saw the biggest PCBs in my life. The size was at least one square meter (10 square feet) and thickness some 1-2cm (0.4-0.8in). They are probably some motherboards or similar for some big machine using high power. We might need to change our SMD lines if we used such boards," he says.

An SMD line is a long term investment

Darekon's first SMD lines were acquired at the beginning of the 1990s. There were several alternatives and working principles available and along the way it has become clear what kind of a commitment the choice is.

Using surface mounted components requires a highly automated production line. After acquiring the first lines, Meriläinen and Pulkkinen have gained a lot of experience on the subject.

Chip shooters and modular lines

"Salesmen around the world were well aware when we started to buy our first line. One boasted about how many of his lines Nokia had and how one would be taken to formula races after buying one. The second had a little smaller machines that Nokia was not yet using, but had one for trial. Well, I have never been to a formula race," grins Pulkkinen.

Chip shooter was a popular type of machine at the time. The typical advantage was its huge speed – 100,000 to 150,000 discrete components per hour. Microchips had to be placed with a different machine since the accuracy of the shooter was not sufficient. Changing the set-up for a different product was also relatively laborious and time consuming.

Modular lines came to the market later and they were assembled from several modules according to the product to be made. One unit would, for example, place discrete components and another microchips. By changing the table, placing head and program it was quick to change from one product to another. Top speed, however, is not so dizzying so there are often several of these lines working in parallel.

A strategic decision

"At the beginning I didn't even understand what a long term marriage the choice of an SMD line is," smiles Pulkkinen. "The placing unit might have cost, for instance, one million (marks) but all the peripherals around it more than a million. When getting another placing unit one could also use some of the peripherals for it. Then the training and time spent getting familiar with the machine's properties and servicing it... One can't change brand very often."

Meriläinen and Pulkkinen have always agreed about investment.

The availability of 8in. floppy disks needed for the program has started to become a problem for this long-serving placement machine.

At the beginning Darekon was using another brand but the firm has stayed with the current machines for a long time now. According to Pulkkinen there have been many things affecting this – growing volumes, flexibility and the speed of changing from one job to another to mention the most important. The current supplier was also the first to offer modular lines.

"It is soon time to start thinking about investment in new lines and now there is a kind of turning point. Everything is changing and it is again time to consider the situation based on our experience. But I don't think I will get to go to a formula race even now," acknowledges Pulkkinen.

Darekon expands in Poland

Darekon has set up new production facilities in Poland that triples the production capacity the firm has there. Darekon's electronics manufacturing in Poland will be concentrated in the new premises while assembly and making cable harnesses will be concentrated in the current facility.

Darekon has operated in Poland for more than 20 years, the last 10 years in the current premises. During the last few years the volume of production has been growing strongly and the firm has been looking for a larger production facility for a long time.

Technically and logistically a good facility

Previously Darekon's Polish production facility consisted of 1,200 square meters (13,000 square feet) in two two-storey buildings. The new facility consists of 2,400 square meters more space in one building and one level. The new facility has an excellent location in an industrial area by a major road, just 20 minutes from the airport and 40 minutes from the harbour. The distance between the current and new facility is just 15 minutes.

The best thing about the new premises is that the building was originally constructed for electronics manufacturing. All the floors are ESD coated and ventilation is according to requirements. Moving to the new place has been easy and economical since no big changes have been needed.

A strong investment in capacity

"Our current facility has been relatively full for a few years," says Kari Koponen, Darekon's plant manager in Poland. "Our current production has fitted in but there has not been space for very much growth."

"Our whole electronics manufacturing work will be centralised in the new facility. We have, among other things, considerably increased our SMD capacity. Besides the old production machines we have also acquired a more productive SMD line representing later technology and in practise doubling our SMD capacity. The new line is one of the well known Siemens machines – practically similar to those in use at our Haapavesi plant."

In the current facility Darekon will concentrate on final assembly and production of cable harnesses, according to Koponen. Assembly requires space which has lately been limited. Cable sets for demanding clients have been produced in the current facility for years already and now it is possible to expand this production.

A ready-made home

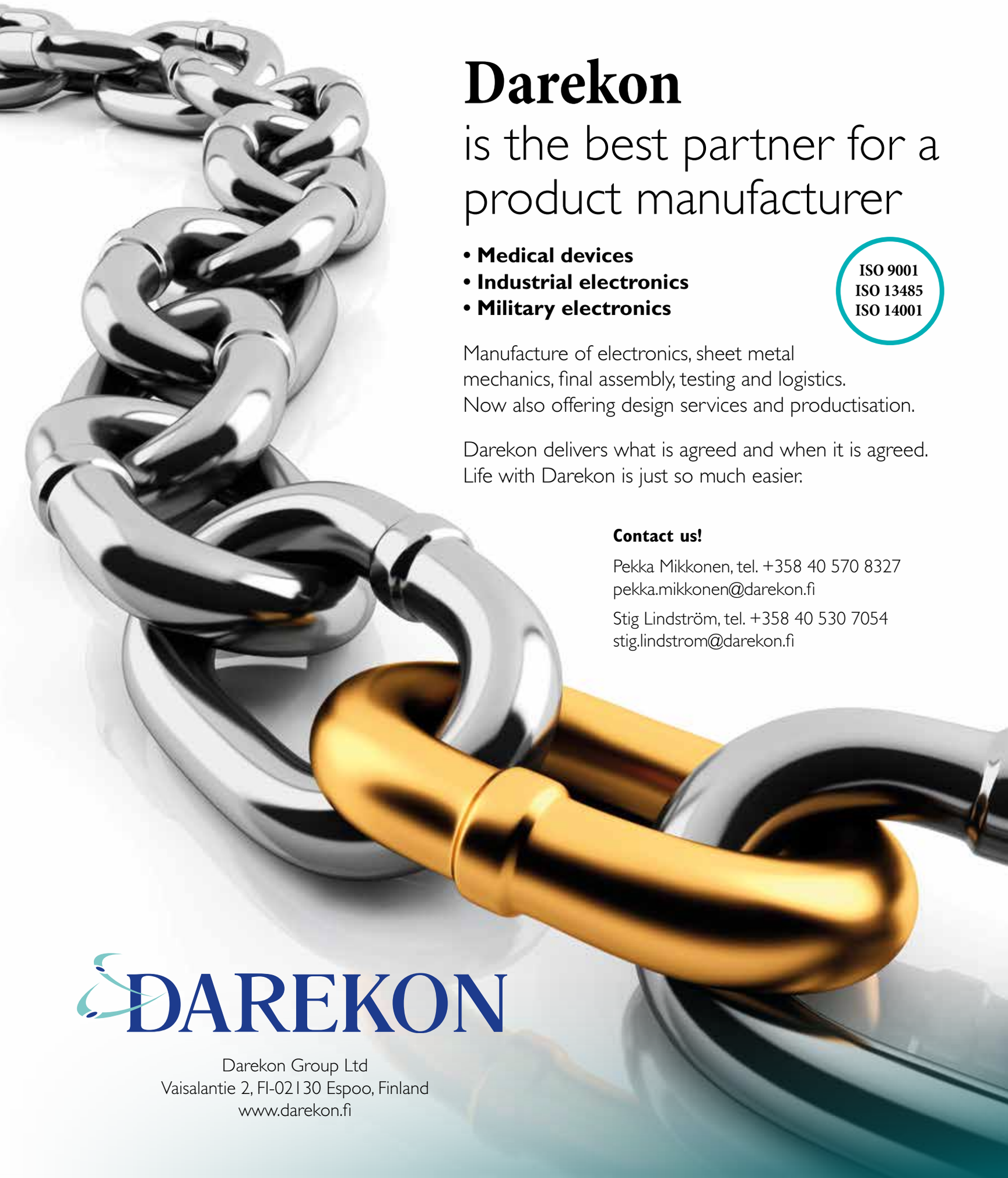
When the plant in Poland started to get full, a serious alternative was to expand it and build a new building. A building project however is a project of its own, requires a lot of work and inevitably creates disorder in the surroundings. Moreover it would have taken a couple of years to complete.

With the new facility it is possible to triple capacity. The availability of labour is good so the capacity will be increased flexibly by hiring new people as the order backlog grows.

Opening the new facility in Poland is a good addition to the whole services portfolio of the company and gives the whole Darekon Group the possibility of expansion. The production requirements of clients have diversified and taking care of new clients requires even more efficient production. Following the expansion these requirements can now be taken care of more easily than before.

"Our Poland plant now offers the possibility for really economical production," emphasises Koponen. "Even if the labour cost in Poland is rising, the expenses are still very competitive. We have good and skilled staff, modern production machines and logistically we are very close to both Northern Europe and the large markets of Central Europe."

"We also now have plenty of good space for producing even the most demanding products. The new facility gives us a very strong competitive edge in producing industrial electronics. We can now serve our clients with production runs larger than before and with flexible schedules. Now there should be no obstacles for winning new business," smiles Koponen.



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