Comatec Group, Customer Magazine 2/2013

COMATEC news

COMATEC news

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Editorial

Economy turning from recession to slow growth

The news being spread recently by various bodies involved with the economy, both in Finland and on the international front, is that there are signs that the long period of economic depression is coming to an end and a slow recovery has begun. This observation is supported by the way economic activity has picked up in the euro zone and the economic situation has stabilized in some of the EU crisis countries, although the disturbing youth unemployment figures form a very big challenge to peace in our society.

The year that is drawing to a close has been characterized by extensive statutory personnel negotiations, lay-offs and redundancies. Adapting to an international market that is continuously changing demands the ability to react quickly, whether we like it or not.

Our extensive customer base in technology industries has also had to undertake measures to enhance efficiency and make adjustments to their organizations. These have been unavoidable for their own operations, if they are to maintain their position in global markets where competition is constantly intensifying. It is expected that these measures will have an impact In terms of improved profits in a few years' time. It is to be hoped that, as the economy takes its first steps towards growth, business news will give us more fine examples of success achieved by Finnish industry and Finnish knowhow around the world.

Looking to the future, it is worth noting that the central organizations in the labour market in Finland, working to a tight schedule, succeeded just a short while ago in drawing up a draft collective agreement, containing moderate wage rises for at least the next two years. It is true that the wages agreement signed by the central organizations still requires the backing of a sufficient number of trade unions by the end of October. If this does not happen, it would be an indication of an irresponsible, selfish and short-sighted labour market policy.

I also believe that the proposals made by Prime Minister Katainen's government on its taxation policy for next year will be approved by Parliament. They will help create the conditions for companies to grow and expand internationally. The period for the temporary tax imposed on banks will end in 2015, which is expected to make it easier for banks to finance capital expenditure. Another positive factor is that interest rates are forecast to remain at a moderate level for some time yet.

The competitive standing of exporting companies has weakened against that of competing countries regrettably quickly. Despite this, the amount of paid free time has continued to rise in Finland. This is an unsustainable trend. We must have the courage to revise the regulations governing work in Finland to give greater motivation for working, and through this to safeguard our competitive standing when facing the pressure of globalization. It is the responsibility of labour market organizations and the country's government to revise the regulation of working life so that companies and employers in Finland have the prerequisites for growth, developing and providing employment. At the same time it is necessary to make sure that employees have the desire and are equipped to continuously develop their knowhow, so that they can obtain work and maintain their fitness for the labour market.

Aulis Asikainen
Comatec Group CEO

Mega smelting plant in Saudi Arabia

Outotec and Comatec in close partnership

Saudi Arabia's Cristal is building a large ilmenite smelting plant in the south western part of the country. Outotec Oyj is supplying the plant on an EPC basis (Engineering, Procurement, Construction), which comprises the entire project, from initial works to commissioning. This is the largest EPC project to date in Outotec's history. Comatec is a major sub-contractor in the project.

TEXT: HEIKKI HARRI

Saudi Arabia's Cristal, the second largest producer of ilmenite in the world, is building a large ilmenite smelting plant in the south-western part of the country. Ilmenite is an iron titanium oxide and the main ore of titanium. Cristal's new smelting plant will produce titanium dioxide slag. This is used to produce a white powder pigment that is used in products such as paints, plastics and paper. In the new smelting plant the slag will be granulated and then transported one thousand kilometres to a pigment plant. To start with, the plant will produce 500,000 tonnes of slag a year, but it is planned eventually to raise this to one million tonnes.

Outotec Oyj is supplying the plant on an EPC basis (Engineering, Procurement, Construction), which comprises the entire project, from initial works to commissioning. This is the largest EPC project to date in Outotec's history.

Comatec for its part is a major sub-contractor in the project.

"Obtaining a project of this scale didn't happen overnight. The first contacts took place five or six years ago, and we signed the final contract in May last year. But we had already started making preparations before that, so that we were ready to start the actual work straight away in June," says project manager **Petri Jokinen**, who is in charge of the project at Outotec.

Mega project

The order received by Outotec has a value of more than EUR 350 million. The contract covers everything possible and has demanded and still demands a significant amount of work. One factor that has placed extra demands on the work is that all the structures had to be designed to withstand earthquakes.

"We started the overall planning back in September 2011. Only the key personnel are from Outotec, in this project about 15 people. Their job is to make sure that everything takes place in accordance with the overall plan. The actual engineering work was allocated to several companies, and we also used many Finnish and non-Finnish engineering workshops," explains Petri Jokinen.

"Comatec's part of the work is related to equipment procurement. This has been split into a variety of different sized packages, altogether 60 packages. Comatec was allocated 15 equipment packages, which is about 25 per cent of the total.

"Outotec has frequently worked in the past with Comatec. This time, as before, cooperation has been very smooth, once we had both learnt the common working methods," states Petri Jokinen.

"So far everything has gone to schedule, for 90 per cent of the equipment is already on site and the work is going ahead at full speed. There are about 1500 people working on the site, and at its peak towards the end of the year the number will rise to 2000. The work is being carried out by a local construction company after competitive tendering, but most of the workers are actually from abroad. The work force

is competent, for we recently passed the mark for three million accident-free hours of work. We celebrated this landmark on the site."

New smelting technology

In 2002 Outotec decided to make smelting technology for ilmenite one of its focuses. Following several years of development and design work and marketing the company succeeded in signing a contract for its first ilmenite smelting plant delivery. At the same time Outotec has changed its focus from being an equipment and technology supplier to being a turnkey project supplier.

"As part of our project deliveries we also try to find ways to develop new technology solutions. In this project we have applied the slag granulation process that is commonly in use in other types of smelting plant. In this process the molten slag is fragmented into droplets and then cooled with jet streams of water, instead of allowing the slag to cool down and solidify in pots. Since the product has a granule size of 0.1-1 mm, granulation produces exactly the right size of slag straight away. In the commonly used process, after the product has cooled down slowly in pots, the product then has to be crushed, sieved and ground to the right size. So granulation significantly reduces the through put time for the product and energy consumption," says Petri Jokinen.

Obtaining water is also not a big problem, for one of the benefits of the location of the smelting plant is that the ground water lies at a depth of only 1.5 metres. The region is in fact the only part of Saudi Arabia where it is possible to practise agriculture on a full scale. The smelting plant is located in Jazan Economic City, and choosing this region as the location for the plant is part of the efforts by the Saudi Arabian government to develop completely new areas.

The smelting plant will be commissioned in the second half of next year. After the commissioning Outotec still has a two-year contract for training, service and maintenance.

Engineers put packages together

Mega projects like the ilmenite smelting plant are split up into smaller packages, and these are put together at Comatec by project managers **Jukka Viheriälehto** and **Mikko Wihervaara.** The work is so intensive that they are based at Outotec's premises in Espoo.

Jukka and Mikko are putting together some 15 packages, varying in size from less than EUR 100,000 up to EUR 5 million. The time required to put together the packages varies to the same degree.

"Our three largest packages required six months' work before purchase, but of course we were partly working on them at the same time. Fortunately we were able to start in good time, for we began to put the packages together provisionally at the beginning of February in 2012," they report.

Putting packages together includes contacting and negotiating on tenders with numerous potential equipment and component suppliers, drawing up technical specifications, and – a very important element – schedules, for the equipment has to arrive at the site on a specific date. Most of the purchases come from Europe and Asia.

The project managers do not design anything themselves; they examine the documentation and designs for equipment to make sure that the equipment meets the requirements and that everything goes right first time. So far they have succeeded in this. Some of the work continues until the end of this year.

Jukka Viheriälehto and Mikko Wihervaara from Comatec Group, with Petri Jokinen from Outotec in the middle.

Beneq – coating technology

The roll-to-roll ALD coating line supplied by Beneq creates the coated film shown in the picture.

Nanotechnology is already part of everyday life for people today. Nano-coatings can completely transform the properties of materials. Atomic layer deposition (ALD) technology is one of the best methods for producing thin films. One outstanding property is that coatings can be built up adding one atomic layer after another. Beneq designs and manufactures coating equipment that utilises nanotechnology. Comatec has been involved in the design of the WCS 500 roll-to-roll ALD coating line.

TEXT: TAINA SYRJÄNEN

Nanotechnology is part of everyday life for people today. It is in the dirt-resistant coatings on clothing, it makes sports equipment long-lasting and light weight. It is used in flat display screens and in many different ways in medicine, lighting and energy.

Nanocoatings utilise ALD technology that was developed in Finland back in the beginning of the 1970s. The outstanding property of ALD technology is that coatings can be built up adding one atomic coating after another. It is one of the best processes for producing thin films.

Nano-coatings can completely transform the properties of materials. Windows can be made self-cleaning, the wear resistance of plastics improves, and jewellery retains its shine. There is almost no limit to the potential uses.

Atomic Layer Deposition

ALD (Atomic Layer Deposition) takes place in a vacuum reactor, into which appropriate compounds of the atoms needed for building the coating are brought. They are brought in with pulses of gas, and the gaseous source materials then react on the surface of the item being coated.

The thickness of the coating can be controlled to a precision of a single atomic layer. Typical film thicknesses are 1 – 100 nanometres. The thickness of the film does not depend on the geometry of the surface; the film grows on all surfaces.

This process gives good adhesion and it can also be used to coat porous materials or particles.

Coated films can be used as protective and functional films for next generation organic electronic applications, organic photovoltaic cells and packaging material. ADL has proved to be one of the most promising technologies for these purposes.

First of its type in the world

Beneq designs and manufactures coating equipment utilising nano-technology. The company has developed technology for making even better coatings. The coatings can, for example, be excellent conductors of electricity and transparent, or they can prevent the passage of liquids or gas.

pioneer

Beneq has supplied the ASTRaL1 laboratory in Mikkeli, part of the Lappeenranta University of Technology, with equipment for atomic layer deposition using a roll-to-roll process on an industrial scale. The ADL roll-to-roll WCS 500 Web Coating System supplied by Beneq is the first in the world.

”This process can be used, for example, to protect electronic equipment that is sensitive to moisture. With this process, the level of water penetration falls to one thousandth or even a millionth of that with plastic film,” says **Pekka Soininen,** R&D manager at Beneq.

Metre of coated film a minute

The equipment can be used to coat a 500 millimetre wide flexible substrate such as polymer film. The rolls of the material being coated can be hundreds of metres long. The equipment produces a metre of film a minute and about 30 square metres in an hour. The equipment weighs five tonnes and consists of several separate units. The round coating chamber is the largest of these and has a diameter of nearly two metres. The equipment includes a vacuum pump and a filter unit, which are used to obtain a low pressure in the chamber.

“The equipment supplied can already be used on an industrial scale,” says Soininen.

Comatec has taken part in the design of the WCS 500 system

Kauko Strandberg, a senior designer at Comatec in the processing machinery business unit, was one of the team carrying out the mechanical design for the WCS 500 system.

”I took part in designing the gas feed unit and the gas evacuation system for the WCS 500,” says Kauko Strandberg.

He has been involved in designing several other ALD equipment, including the TFS 600, P400A, TFS 500 and P800. He was still working on the last two of these at the time of this interview. He has designed for example reactor chambers, the main housing, metal casings, as well as the gas feed and evacuation system mentioned above.

”I have been designing ALD reactors since 1997 for three different equipment makers. My work with Beneq began a couple of years ago,” says Kauko.

”Our cooperation with Kauko and Comatec has gone very well. Kauko is very competent and a good type,” says Pekka.

[1] ASTRaL = Advanced Surface Technology Research Laboratory

Photo courtesy of Beneq Oy

Kari Kostiainen, Managing Director, Kilpiset Oy

Kouvolan veturi and Kilpiset Oy's oval shaped boxes

The Veturi (Locomotive) shopping centre built by Kesko in Tervaskangas in Kouvola is the largest shopping centre in south-eastern Finland and the sixth largest in Finland. More than 100,000 people live within its catchment area. Kilpiset Oy built the oval-shaped LED light boxes, the RGB handrail lighting, the Digital Signature totem poles, the LED outdoor signs, the landscape stickers and traffic signs. Jari Pätilä, chief designer at Insinööritoimisto Metso, was responsible for the structural and CAD design of the oval light boxes, handrail lighting, outdoor signs and totem poles.

TEXT: TAINA SYRJÄNEN

All the key figures for the Veturi shopping centre are big: the building is 440 metres long and has a circumference of 1.2 kilometres. The plot of land has an area of 14 hectares. The shopping centre has 1,700 parking spaces and they are at ground level. The grounds are dominated by the 30 metre high advertising tower that forms a landmark in the area. The shopping centre has a curved shape and an imposing double façade, with the outer façade of digitally printed glass.

Veturi is one of Kesko's largest projects ever. The shopping centre has a gross floor space of 60,000 square metres. Despite its size, feedback from customers shows that they find it simple to find their way around Veturi, with easy and unobstructed access. The electronic signs in Veturi make it easier to find places, and these were created by Kilpiset Oy, Finland's leading sign manufacturer.

"At the Veturi shopping centre in Kouvola, Kilpiset Oy created the oval LED light boxes in the ceiling, the RGB handrail lighting, the Digital Signature totem poles, the LED outdoor signs, the landscape stickers, and the traffic signs," says Kilpiset Oy Managing Director **Kari Kostiainen.**

"We worked closely with the main architect and the builder. Of course we also reported directly to the client Kesko throughout the project," says Kari Kostiainen.

Oval-shaped atmosphere creators

The shopping centre project was carried out with a project management model in which Pöyry Plc was the service provider and Kesko the client. The project was divided into 150 sub-contracts. Contracts were made directly between each sub-contractor or supplier and Kesko.

Pöyry managed and assessed all the requests for tender, made the contracts and placed orders. The client Kesko always had the final say, however. Offers were requested from several suppliers for each sub-contract.

"Creating the oval-shaped light boxes in the suspended ceilings in the shopping centre was not an easy job. In fact it looked as if there wasn't anyone in Finland to carry out the vision of architect **Antti Ahlgren**," says Kari.

"I saw the picture that Ahlgren had drawn on graph paper of what the box should look like. Since we had done something similar at Helsinki/Vantaa airport, I said that we could build a prototype," Kari recalls.

"**Jari Pätilä** from Insinööritoimisto Metso drew the structural designs and CAD diagrams which we used to build a prototype, and the customer approved this. It was only after this that we were we able to make an offer for this sub-project.

"This was a product that had not been made before and no solution existed for building it. The answers were found together after discussion between the different parties," says Kari.

"Important elements in the operations of Kilpiset Oy are being open with the client and open dialogue with all parties involved, i.e. architect, builder, designer and those making the product at the factory."

"Cooperation and openness were outstanding in this case between all the

parties involved," states Kari.

The oval light box has a diameter of 40 metres. It consists of 1.8 metre long sections that are all different. Four oval boxes were made, and they have a combined length of 450 metres. A separate CAD diagram was drawn for each section. A project like this requires hundreds of diagrams.

Jari Pätilä, chief designer at Insinööritoimisto Metso, part of Comatec Group's production equipment and systems business area, created the designs and turned the ideas of architect Antti Ahlgren into feasible CAD diagrams.

"Without Pätilä's diagrams it would not have been possible to produce the sections. We were able to transfer Pätilä's precise CAD diagrams straight to the cutter and milling machine, making it possible to cut the sections extremely accurately. The dimensions of the sections were out by less than half a millimetre," explains Kari.

Production of the oval light boxes, from design to installation, took a couple of months. It was possible to assemble and install some of the oval boxes while others were still being designed.

Digital Signature totem poles

"The layout designer had already made sketches for the electronic signs and prepared the graphical design for them. So the request for tender included pictures of what they should look like but not the technical details of how to make them," says Kostiainen.

"During the request for tender phase we carried out some R&D on the product. We aimed to improve the products, to make them lighter in weight and internally illuminated. We replaced the steel in the original designs with aluminium. We built air conditioning and ventilation inside the totem poles. We used glass for the front instead of steel plate.

"Jari drew the products, made a part list, specified the dimensions, and made structural diagrams and 3D modelling for the customer. The CAD diagrams were transferred directly onto the machine for production. Each piece of glass and its holes had to fit exactly in its place on the frame," Kostiainen continues.

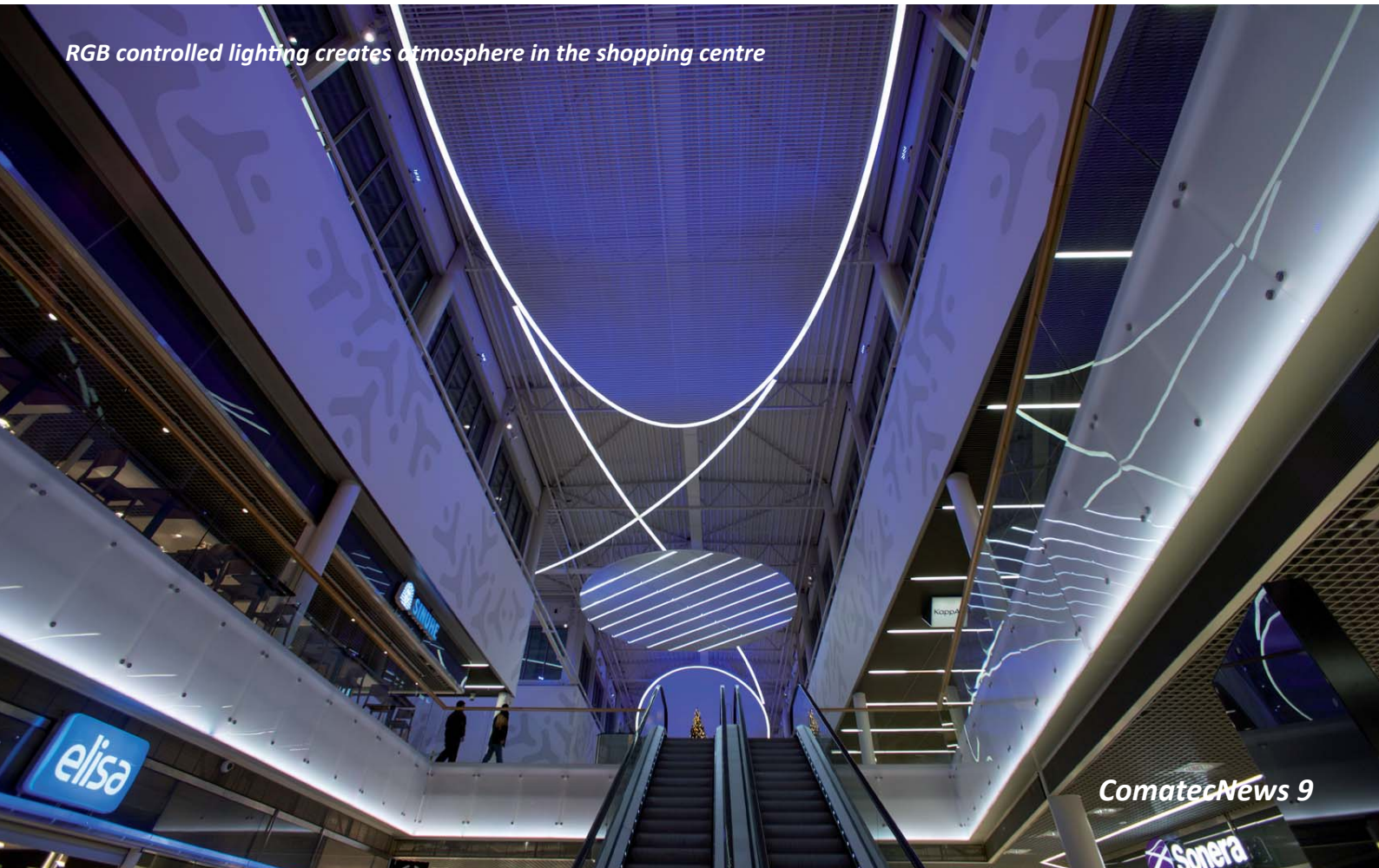
"The parts were cut and the frames welded and painted at the Kilpiset Oy factory in Imatra. The glass, in which the manufacturer made the holes, came straight from the glass manufacturer."

And that's not all

"We carried out several sub-projects at the shopping centre. The RGB handrail lighting was the first of these. We built altogether 300 metres of handrail lighting there," says Kari Kostiainen.

"We also built the outdoor signs, which have LED lighting and are heated. Once again we started on the basis of the request for tender to develop a better product. The outdoor signs have heating and air conditioning to prevent them from steaming over when the weather turns warmer after a cold spell. They have an aluminium frame and glass on the outside on both sides. The glass itself is clear, but a plate has been taped inside the box that allows the light to pass through openings. Kilpiset supplies the following printed material, as well as various landscape stickers: patterns, text, logos and sandblasted stickers.

The traffic signs in the shopping centre car park are also from Kilpiset.



RGB controlled lighting creates atmosphere in the shopping centre

Comatec Group at Trade Fairs

Comatec Group is and has been an active participant this autumn with its own stand at trade fairs in Finland. It is also possible to visit the company's stand outside Finland at the Instrutec Fair held in the middle of November in Tallinn. The Group's subsidiary Rantotek Oy took part in the China Paper Trade Fair in Peking on the joint stand set up by Nordic Ventures Group.

Comatec took part in **the EuroMining Trade Fair** held for the first time in Tampere 11 – 12 September 2013. The new event offered operators in the booming sector a long-awaited forum for creating international contacts, showcasing new products, and discussing future solutions. Special attention was paid to mining technology, financing, safety and environmental issues. The international trade fair for mining technology brought together professionals in the fields of mining and quarrying, geology, concentration and processing, and metallurgy for two days at the Tampere Exhibition and Sports Centre.

There were 191 exhibitors from 11 countries at the fair, which received 3874 visitors from more than 20 countries. An encouraging number of the participants also came to Comatec's stand to learn about the company's wide-ranging knowhow in the mining industry.

Comatec subsidiary Rantotek Oy took part in **the China International Paper Technology Exhibition and Conference** held in Beijing, China on 23 – 25 September. Rantotek was with other Finnish companies on the joint stand arranged by Nordic Ventures Group in the Finnish pavilion. Comatec Group's Boilers and Power Plants business sector was on display at the fair, with the goal of obtaining consulting work in the Asian market.

Comatec took part in **the Subcontracting Fair** at the Tampere Exhibition and Sports Centre on 24 – 26 September 2013, when the event celebrated its 25th anniversary. This fair is the number one industrial event in Finland, showcasing the metal and mechanical engineering, electronics, plastics and rubber industries, ICT solutions for industry, and design and consulting for these sectors. Despite the challenging times, the number of visitors rose by almost one thousand. Over the three day event 16,699 decision makers and experts from industry visited the fair, which had a record 993 exhibitors from 20 countries. The fair was once again a success for Comatec. New and old friends visited the

stand to exchange news and views.

TEKNOLOGIA'13

Comatec took part in **the Teknologia'13 Expo** at the Helsinki Exhibition and Convention Centre 1 – 3 October 2013. Teknologia'13 brought together the main trade fairs for individual sectors into a single mega event for the technology sectors. The main events in their sectors were under the same roof: Automaatio (automation), Elkom (professional electronics), Hydrauliikka & Pneumatiikka (hydraulics and pneumatics) and MecaTec (mechanical engineering). Comatec's stand was in hall 6, Hydraulics and Pneumatics. Comatec highlighted its specialist knowhow in technology for intelligent motion control.

On the stand were Comatec's experts from its competence centre for intelligent motion control and digital hydraulics. The centre provides energy efficient and cost effective design packages with considerable novelty value for various machines and equipment, for mining and earth moving equipment and many other machines. At the trade fair Comatec highlighted its EEMC philosophy (Energy Efficient Motion Control). The services provided by the competence centre include concepts, initial design, design, and construction and testing of prototype, and these can be a standalone service or combined with other services offered by Comatec.

November 13 - 15
INSTRUTEC 2013

Comatec is taking part in **the Instrutec 2013 trade fair** to be held 13 – 15 November 2013 in Tallinn. This is an international event corresponding to the Finnish Subcontracting Fair. This is the 19th time that the event is being held, and it has established itself as a major event. Comatec is highlighting in particular its Tallinn office and the knowhow of Comatec Estonia OÜ.

New addresses

Lappeenranta office

Comatec Group's Lappeenranta office moved in the spring into new premises right in the heart of Lappeenranta. The office celebrated the move with an open day for clients with coffee and cake in the middle of June.

The new address in Lappeenranta is: Kauppakatu 61, 53100 LAPPEENRANTA.

Kuopio office

The Kuopio office also moved into new premises – but in the same building, Technopolis, so the address did not change.

The address in Kuopio is therefore unchanged: Microkatu 1, 70210 KUOPIO.

Oulu office

Oucons Oy also moved in the spring, into new, more spacious premises in Oulu.

The new address for the Oulu office is: Kaarnatie 14, 90530 OULU.

Appointments:

Pasi Rantanen, B.Sc. (Tech.)

joined the Järvenpää office as office manager on 12 August 2013. His main duties are expertise, project and solution sales and office administration.

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