



**PIPE WORLD 1·2006**

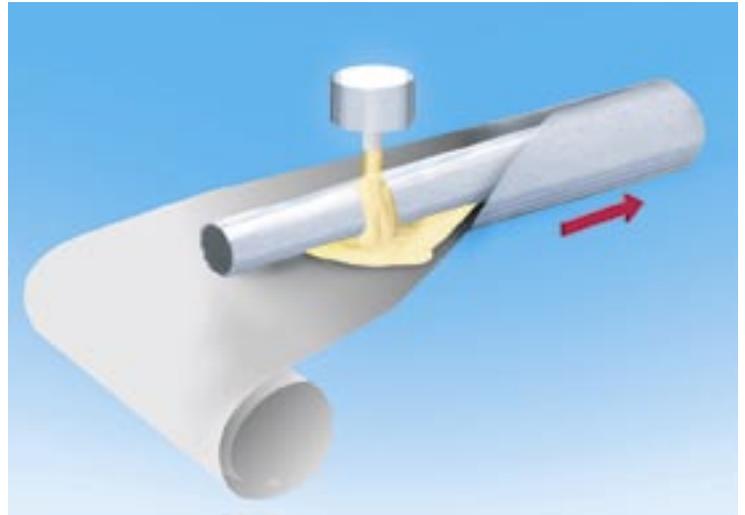
**KWH PIPE TECHNOLOGY**

**District cooling with large pipes | District heating pipe pulled under river**

**PIPE WORLD – THE KWH PIPE CUSTOMER JOURNAL**

# Production lines for **flexible PU insulated pipes**

Flexible PU insulated pipes are manufactured on a continuous manufacturing line. The production machinery includes decoilers, centric calibration, a film infeed unit, a 4-component foaming machine, laminator, extruder, haul-off and coilers. The pretreated plastic film provides a diffusion barrier, ensures excellent adhesion to the PU and welds to the external PE casing pipe during the PE extrusion process.



## **Main applications:**

- secondary network for district heating or cooling
- house connections
- agriculture
- plant construction, oil and gas pipelines
- heating and plumbing
- high effective transitory above-ground cooling or heating transfer

## **For our customer, flexible PU insulated pipes provide a number of benefits:**

- Continuous production method enables long delivery lengths
- Flexible pipes can be installed directly underground and thus require a smaller ditch
- Excellent mechanical properties
- Online extrusion ensures practically impermeable, chemical-resistant and corrosion-free casing pipe
- Flexible PU insulated pipes are easy to transport, handle and store

### **Product**

Production line for PU insulated flexible pipes

### **Output**

4 - 6 m/min  
(max. speed 12 m/min)

### **Size Range Carrier Pipe**

16-110 mm

### **Structure**

PEX or PE/PU/PE



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## Know-how and high-tech

KWH Technology's history goes back to the 1950s, when we manufactured the first welding machines and, a few years later, extrusion-line equipment. For the first few decades Tech was an engineering works that served Pipe's production units worldwide. The main emphasis was on developing and constructing equipment that was not commercially available on the market.

The actual technology business operations were launched in the mid-1980s, when an engineering unit was set up and the first district-heating pipe plant project sold to South Korea. The commercial production of PU foam equipment began at that time. Urethane technology is still part of Tech's business operations today, even though it accounts for quite a small part, as does the welding equipment, sales of which are mainly the responsibility of the sales company in Germany.

We have increased the product portfolio resolutely during the past few years, with the aim of seeking niche products in the sub-areas of plastic technology, such as automation units for the production of EF fittings, DH flex element, steel pipe coating, barrier films, board coating etc. The products complement each other either from the customer's perspective (e.g. pipes and components) or production can use existing know-how (e.g. steel pipe coating, extrusion). We are not interested in large volumes in individual products but in comprehensive solutions that are of service to customers and can use KWH's decades of expertise in the production and use of plastic products. Good examples of this are licensing and franchising.

The plastic-product market is expanding more quickly than the world economy on average, and we feel there is a market for our products, both now and in the future. New entrepreneurs, who deal with machinery for the plastics industry, have come onto the market, e.g. a number of Asian equipment manufacturers, but by concentrating on top-quality solutions of a high automation level, we believe that significant demand for our products will be ensured.

We wish to continue investing in top quality and reliability in all our operations.

**Jari Mylläri**

Director, Business Area Technology

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#### PIPE WORLD

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## NEWS

### [ SPAIN ]

## Construtec representing KWH Pipe Project Services

[ OVER THE YEARS, KWH Pipe has carried out numerous projects in Spain and the Mediterranean. Recently, Project Services teamed up with the Spanish company Construtec ([www.construtec.es](http://www.construtec.es)) in order to better promote its capabilities of producing, designing and installing large-diameter piping. The partnership with Construtec will enable KWH Pipe to have a closer relationship with the Spanish market for intakes and outfalls used for various applications. At Smagua 2006, the large exhibition for the water and environmental industry held in Zaragoza on March 28-31, KWH Pipe participated at Construtec's stand. The DN/ID 3,000 mm Weholite pipe displayed there reportedly created a lot of interest among visitors.



### [ ITALY ]

## Cooling down at the Olympic Games

[ THE SWEDISH COMPANY Ice & Turf Technology, formerly known as Spicetec, was responsible for constructing the cooling systems for the ice stadiums at the Torino 2006 Olympic Winter Games. It was granted the honour to perform this prestigious task due to its long record of similar projects in countries ranging from traditional winter sport countries like Sweden, Norway and Finland to more exotic countries such as Saudi Arabia.

The pipes used in Ice & Turf Technology's cooling systems were produced by KWH Pipe and are specifically tested for this type of application. Approximately 150,000 metres of blue and yellow pipework were required to complete the Olympic-sized ice rinks and to ease identification. The pipes were marked with both the manufacturers' and customers' logos.

### [ LITHUANIA ]

## Sales office opened

[ THE NEW KWH PIPE SALES OFFICE in Lithuania is just a 5-minute drive from Vilnius airport. First, the office will be manned by Sales Manager Karolis Rekertas, but another member of staff will join him later. The products on sale come from KWH Pipe production plants in the neighbouring areas.

In addition to the Lithuanian and Latvian markets, KWH Pipe also wants to provide service to Lithuanian contractors working in the Kaliningrad area.



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### [ NORWAY ]

## Intake pipe for fish farm

[ SALAR SMOLT A/S in Bergen, Norway, recently chose Weholite pipe to carry fresh, cool water from a nearby lake to the fish farm. A floating construction at the intake is manoeuvred manually and can be used to adjust the temperature of the fresh water flowing in to the fish farm, making use of the natural temperature strata of the lake.

The structure is made up of about 1,200 metres of Weholite pipe with an inside diameter of 1,000 mm. Seen from the intake grid, the first 1,000 metres of the pipe (ring stiffness SN4) are submerged in a canal and the next 200 metres (ring stiffness SN8) are below ground and connected to a distribution chamber by the fish farm. The distribution chamber, also manufactured by KWH Pipe Sweden, is for distributing the fresh water through 15 distribution pipes to the tanks where smolt is raised to a size suitable for stocking.

The Weholite pipes are delivered in 19-metre lengths and welded together on site. The welding method is extrusion welding.

Parts of the Weholite pipe consist of prefabricated parts specially adapted to the customer's needs, e.g. a branch for the connection of a future supply pipe etc.

## Extron expands into the Nordic countries and the Baltic states

[ EXTRON ENGINEERING LTD, a subsidiary of KWH Pipe, aims at gaining ground in the extrusion technology markets in the Nordic and Baltic countries. To promote this aim, at the end of 2005 Extron Engineering signed two new agency agreements in both market areas. Extron's agent in the Nordic market is Safic-Alcan and in the Baltic countries it is BATCOPlast OÜ. Both agents can be reached via the Extron websites at [www.extron.fi](http://www.extron.fi)

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**[www.batcoplast.com](http://www.batcoplast.com)**

## APPOINTMENTS



### Poland

Mr **Piotr Jablonski**, M.Sc. (Eng), has been appointed Managing Director as of 1 March 2006. Mr Jablonski

has worked as General Manager and Sales Manager for companies such as Siemens Building Technologies, Lido Technology and Danfoss in Poland.



### Sweden

Mr **Bo Hennings**, M.Sc. (Econ), has been appointed Managing Director as of 1 March 2006. Mr Hennings has

previously worked as Managing Director of Borgstena Textile Sweden AB.



Mr **Patrik Rosencrantz** has been appointed Sales Manager as of 1 January 2006. Mr Rosencrantz has previously worked for Viega

and LK Golvärme. His duties include the promotion and sales of Building Technology products in Sweden.



### Denmark

Mr **Ulf Zinn** has been appointed Sales and Product Manager for environmental and sewage products as of

1 December 2005. His duties include promotion and sales of the WehoPuts domestic wastewater treatment plants and related products in Denmark.



### Lithuania

Mr **Karolis Rekertas** has been appointed Sales Manager for Lithuania as of 15 February 2006. His

duties include promotion and sales of products of the KWH Pipe factories in Europe.



### Project Services

Mr **Anders Nystrand**, B.Sc. (Eng.), has been appointed General Manager for

the Project Services organisation as of 1 January 2006. His duties include responsibility for sales and project execution.



### Technology

Mr **Kari Ahven**, B. Sc. (Eng), has been appointed Sales Manager as of 1 February 2006.

Mr Ahven has previously worked as Project Manager at Wärtsilä Finland Ltd.



Mr **Pekka Luntta**, B.Sc. (Eng), has been appointed Project Manager for Fitting Production Systems as

of 1 October 2005. Mr Luntta has previously worked as Consultant and Project Manager at Tooler Oy.



Mr **Pekka Jokinen**, B.Sc. (Eng), has been appointed Project Manager for Fitting Production Systems as of 12

December 2005. Mr Jokinen has previously worked as Head Designer at Foxconn Oy and Tooler Oy.



Mr **Jari Ketomäki**, B. Sc. (Eng), has been appointed Sales Director for Extron Ltd as of 1 March 2006. Mr Ketomäki

has previously worked as Automation Engineer at RT-Systems Oy.



## [ THAILAND ]

### Inauguration of Wiik & Hoeglund's new factory

**[ UNDER THE BRIGHT BLUE SKY** of 15 November 2005, 200 invited guests and the management team from KWH Pipe from Finland and Canada gathered to congratulate their Thai hosts in occasion of the new factory grand opening. A few hours driving from Bangkok, this BOl-promoted plant, situated in Amata City Industrial Estate on 20 acres of land, is capable of producing pressure pipe for drinking and raw water, as well as non-pressure pipe for applications such as sewage, drainage, electrical and communication cable conduit, etc.

Following the impressive ceremony in the morning, the guests were escorted on a brief factory tour. With better technology and improved product design, these new applications will enable the company to diversify its operations and expand its income base in Thailand and throughout the Asian region as a certified ISO 9001:2000 manufacturer.

At the same time, 50 years of pipe production was celebrated by a golf tournament at Pattaya Country Club & Resort. The event was successfully concluded after the dinner and prize presentation to the winning golfers and the closing speech from Mr Peter J. van Haren, CEO.

**T**he history of KWH Pipe Technology goes back half a century. KWH Pipe's role as a leading manufacturer of plastic pipe systems on the global stage meant that the company had to put a lot into R&D right from the start. KWH Pipe started manufacturing plastic pipes back in the mid-1950s and in 1960, the company had become the world's leading manufacturer of large pipe systems.

"In those days, for all practical purposes, improving plastic pipes was a matter of designing larger and larger diameters – and the company that made the big pipes was always KWH Pipe," says Jari Mylläri, Director, Business Area Technology at KWH Pipe, describing the course of development.

The size of the plastic pipes grew steadily: 400 mm expanded to 600 mm and then a 1,600 mm pipe came onto the market. The diameter of the biggest plastic pipe has now reached three metres.

**SKILL AND TOOLS**

The company that made the first big plastic pipes also had to develop the machines needed for joining the pipes. Large-diameter pipes need their own pipe-fitting tools, pipe-pulling equipment, pipe saws and extruders. Just

producing pipes has never been enough on its own: the pipes have to be joined together and for that, you need plastic pipe welding equipment.

"This is a service that we wanted to provide as well, from the very beginning," says Mr Mylläri, explaining the KWH Pipe philosophy.

There have always been large-diameter pipes, but they used to be made from competing materials, such as steel. Developments in plastic materials made it possible to manufacture bigger and bigger plastic pipes.

So, the reason behind founding the technology unit in 1990 was that KWH Pipe was making frontline products that needed their own special tools.

At the same time, the company has been keen to build up as much expertise as possible to support the actual products. Knowhow in some of the important sub-sectors has also been gained through company acquisitions.

KWH Pipe Technology now has operations all over Finland: the Technology office in the town of Vaasa, Extron Engineering and RT-Systems in the town of Toijala, and Fitting Production Systems in the town of Lahti.

► "There is a lot of 'backyard' manufacturing going on in the CIS countries, so the idea of building a finished factory complete with all equipment is attractive to customers," says Mr Jari Mylläri, Director, Business Area Technology.



# It all began with big pipes

Cutting-edge experts in multi-sector technology

**The Technology Unit was set up 16 years ago to cater for the often unique requirements of customers. The basis for the unit's operations dates back to the 1950s, when the need to develop cutting-edge technology arose from the large pipes being produced.**



Sales offices in Germany and Russia look after customers abroad. One company acquisition that underpinned operations was made in 1985 when KWH Pipe acquired Thermoplan, producer of district heating pipes. Through the deal, KWH Pipe acquired the foaming technology used in insulating district heating pipes with urethane foam. Urethane foam is also used in other insulation applications, such as cold stores and large depot buildings.

“There are other places where foam is used, too, including upholstery and the surfaces of rollers in paper machines,” says Mr Mylläri, describing the diversity of uses. For the technology unit, PU machine manufacture was the gateway to projects for building district-heating pipe factories.

#### **FACTORY-BUILDING PROJECTS AS GROUNDWORK**

After this, the company made a grand entry into the district-heating sector by supplying a

district-heating pipe factory to South Korea in 1986. In another important technology project, the company supplied an upholstery factory to the former Soviet Union.

“It became obvious that the technology side of the business was producing good results and this sparked off the idea of expanding that side of the business,” recalls Mr Mylläri.

When Russia emerged from the Soviet Union, we were one of the first in line to supply a factory for district-heating pipes.

“The number of projects increased in the 1990s through joint ventures, and we carried out factory building projects in Poland, the Czech Republic and China. Cooperation is still continuing with some of the factories, whereas we have withdrawn from some of the others even though business is booming,” explains Mr Mylläri.

District-heating pipe factories are important groundwork for us. Also the CIS countries have proven profitable market areas.

#### **STATE-OF-THE-ART EQUIPMENT FOR THE PLASTICS INDUSTRY**

In 2001, KWH Pipe purchased a majority share-holding in one of its suppliers, Extron Engineering, whereby it acquired essential expertise in the design and manufacture of blown films and pipe production equipment.

For instance, Extron designed and built the world’s first production line for 10-layer films.

“Early on, we built two production lines making 8-layer blown films for Nordpak in Valkeakoski, and in January 2000, we built a production line for 10-layer films,” says Technical Director Rauno Smått, describing Extron’s special expertise.

The pipe production lines made by Extron can also manufacture multi-layer pipes. A production line has been supplied to a client making 6-layer pipes, and possible materials include polyethylene, polypropylene and a large number of special plastics. **DD**

Extron Engineering was founded in 1991 by a group of top professionals in the plastics industry.

“Everyone had 10–20 years’ experience in the industry. The company was founded in the depths of the recession in very modest rented premises,” recalls Mr Smått.

The Finnish plastics industry welcomed the experts with open arms. Business grew rapidly and the firm started exporting. When KWH Pipe bought Extron, it already had a staff of eight. The engineering agency designs, builds, installs and commissions machinery and equipment. Components for the machines are manufactured in the technology unit workshops or supplied by subcontractors who are known for the quality of their work. Today, the company has its own facility in Toijala covering an area of 1,200 m<sup>2</sup>.

### KWH LENDS CREDIBILITY

When KWH became involved, it gave the new and growing company a boost and provided it with the necessary credibility. The staff at Extron take the view that they have re-

ceived solid backing from KWH as well as strong market support. When Extron only numbered a few people, the company was not in a position to compete for all of the most interesting deals, because it lacked credibility.

“Building a complete pipe factory in Kuwait was a job that Extron would not have dared to take on by itself and it certainly would not have won the assignment,” says Mr Smått, giving chapter and verse.

Extron’s chances for growth increased by acquiring a majority share in RT-Systems, one of its suppliers. Extron gained solid expertise in automating production lines and the relevant control systems. The RT-Systems deal also brought along knowhow in electronics and process automation.

“We already have expertise in pipe and film production lines on a broad front,” says Mr Smått.

Finland on its own is not a big enough market for special expertise; operations are dependent on the export trade and Russia is a strong export area.

The product of the future is going to be the manufacture of food-packaging films and we are setting our sights at the Russian markets in this area of expertise.

“Pig carcasses hanging in market halls are a thing of the past. Now food is sold in supermarkets. Food packaging is changing dramatically. We are heavily involved in coating board, too,” explains Mr Smått.

Nowadays, anything is slipped under a plastic film from pizzas to sausage: multi-layer films are the products of the future. Extron builds production lines for large manufacturing plants and for laboratories that need equipment at the test-bed scale.

### AFTER-SALES SERVICE FOR DIES AND EQUIPMENT

The core business of Fitting Production Systems, a new department at KWH Pipe Technology set up eighteen months ago, is manufacturing technology for pipe fittings. The staff are professionals with 20 years’ experience in the industry, designing automation devices and dies for injection moulding.

“THE COST OF JOINTS AND FITTINGS MAKES UP A SUBSTANTIAL SHARE OF THE PRICE OF A COMPLETE PIPELINE,”



“The guiding principle is that we take care of sales, marketing, product development, design, project management, purchasing, testing, customer training and after-sales ourselves,” says Pekka Säävälä, Business Manager at Fitting Production Systems.

The entire process is in the hands of the people that do the job. The manufacturing facilities are in Finland, in and around the town of Lahti.

According to Pekka Säävälä, project management for technology manufacturing is precise but flexible.

The backing provided by a big company like KWH Pipe makes it possible to give guidance in matters such as the purchase of plastic raw material and in the overall design of pipe systems. KWH Pipe also knows about building machinery, tooling and logistics.

“Jointing technology is an essential

element in manufacturing pipe systems. Pipes always have to be joined together and the cost of joints and fittings makes up a substantial share of the price of a complete pipeline," Mr Säävälä points out.

There is a global market for joints and fittings as well. The biggest customers are in Europe, but we supply customers all around the world.

"In Europe, there is some surplus capacity in the industry, but the growth areas in the future are the Middle East, the Far East, the CIS countries and Africa. We will be looking for growth there," says Mr Säävälä.

He goes on to point out that what is needed in projects is training and guidance in the management of systems and production. This is KWH Pipe's trump card: many of their competitors are able to provide dies and even automation, but not after-sales service.

Technically speaking, making dies and automation devices does not call for any kind of occult expertise. The client values

#### MR PEKKA SÄÄVÄLÄ POINTS OUT.

reliability and uniform quality when acquiring dies or production equipment.

"Our motto is 'Easy to use and easy to maintain'. We produce top-quality products that function every day, around the clock. We don't compete on price or quantity, we just sell goods to clients who appreciate advanced systems," says Mr Säävälä pithily.

#### THE FUTURE WILL BRING EVER-INCREASING GROWTH

Business at KWH Pipe Technology shows steady growth. Turnover went up five-fold between the early 1990s and last year. The target is that by 2010, turnover will go up another 250% from today's level.

Growth is sought in new product areas through company acquisitions. Turnover in the licensing and franchising sectors is expected to increase as well. ●



## Licensing sparks off franchising

**K**WH Pipe is always keen to find new approaches to business. One of these is industrial franchising. The idea is that anyone who is interested can set up a pipe factory without having any experience in the sector. Advice can even be given on financing, if necessary. KWH pipes have already been manufactured under licence for about thirty years and the experience gained has encouraged the company to try out franchising operations as well.

Weholite pipes are currently manufactured under licence in eight countries: the UK, Italy, Iceland, Chile, Tanzania, South Africa, Oman and Japan.

"The people who acquire licences are usually people who are already in the business and want to add new products to their range, whereas in principle, even someone with no experience at all can set

up as a franchising operator," explains Mr Lars Häggblom, Director, Weholite Licence Sales. Mr Häggblom likens the licensing relationship to marriage.

"It's a matter of living side-by-side and talking things over. Every day, if necessary."

The first franchising agreement has already been signed and the other party to the contract is a company named Ames from Santiago, Chile, that already produces Weholite pipes under licence.

"They wanted to expand production in pressure pipes and they thought they'd get the best support from a franchising agreement," says Mr Häggblom.

The other party to the contract is able to use the KWH Pipe brand, which has market value throughout the world. A good name is a competitive advantage.

The new franchising concept has aroused a good deal of interest around the world and negotiations are in progress. The potential is very exciting. In principle, a factory can be set up from zero.

"All you need is a piece of land and the urge to succeed. We supply the goods and the information in one big package," says Mr Häggblom. ●



# Major Cambrid

**More than three kilometres of large-diameter Weholite PE-HD pipe was installed recently at the new multi-million-pound Arbury Park development in Cambridge by main contractors Galliford Try.**

**S**upplied by Newport-based Asset International Ltd – Weholite Licensee of KWH Pipe – the Weholite delivery is one of the largest on record and forms parts of a major investment scheme to help minimise the risk of flooding and provide the necessary infrastructure such as roads and utilities in preparation for the city's newest neighbourhood.

In order to maximise the land area that could be developed on the 32-hectare site, whilst minimising the risk of flooding precipitated in part by the area's high water table, the infrastructure design and development required a cutting-edge solution provided in part by using large-diameter Weholite to act as stormwater storage tanks.

Before the stormwater storage tanks could be installed, groundwater had to be drained from the site by way of well-point dewatering.



The tanks will act as a buffer between the new development and the existing main drainage system, storing storm water runoff for controlled release over time.

# ge development gets off the ground

The Weholite installation was then carried out in two stages, the first involving the prefabrication and on-site assembly of four 2.1-metre-diameter tanks. Each tank was delivered to site in eight sections, then welded together to provide a storage capacity of 350 m<sup>3</sup> per tank. This was then followed by the installation of a 1-kilometre Weholite tank, also measuring 2.1 metres in diameter.

The 1-kilometre tank has a storage capacity of 3,500 m<sup>3</sup> which, together with the four smaller tanks, allows for nearly 8,000 m<sup>3</sup> of additional water storage during periods of heavy rainfall, thus minimising the risk of flooding and pollution into nearby water courses. The tanks will act as a buffer between the new development and the existing main drainage system, storing storm water runoff for gradual, controlled release over time.

Specifying Weholite, WSP Development and Transportation Associate Colin Sharp

said: “Our major consideration was finding a product that could easily be adopted by Anglian Water and did not require large-scale jointing. As Weholite was available in lengths of up to 15 metres, the product was

chosen as the best and quickest option for use under public spaces.”

Naturally, preventing flotation of the tanks was the next concern. By using computer-simulated techniques at Asset International Ltd. to calculate Weholite’s breaking point, the decision was made to put a concrete slab on top and the tanks were joined to the existing network by way of a band seal.

Commenting on the early success of the works, Richard Lakin, Site Agent at Galli-

ford Try, said: “The speed with which the Weholite tanks were installed was impressive. Despite some wet weather in December, the first four tanks went in in less than two weeks, whilst the remaining 1-kilometre

tank was installed in around a fortnight.”

“As the average 14-metre length weighed around 3.3 tonnes compared to 8.6 tonnes per 2.5 m length in concrete (a total of 49 tonnes), we were also able to use lighter equipment and any alterations needed could be made on site without holding up other works.”

Work on the stormwater storage tanks will be completed in March, while the remainder of the first stage of infrastructure work is scheduled for completion in July. •

**“THE SPEED WITH WHICH THE WEHOLITE TANKS WERE INSTALLED WAS IMPRESSIVE. THE FIRST FOUR TANKS WENT IN IN LESS THAN TWO WEEKS, THE 1-KILOMETRE TANK IN TWO.”**

# First delivery of improved Wehomatic automation unit

**The new generation of Wehomatic automation units features a number of improved qualities. The first delivery took place early this year. The client is a well-known European manufacturer of PE pipe fittings. Crucial for the client was the reduction of manual phases in production resulting in higher levels of quality and output.**

**K**WH Pipe delivers a complete solution. KWH not only makes the machinery, it trains the client's operatives and does not ship the equipment until it has been fully approved by the client.

For this client, continuous high-quality output and low production costs were pivotal factors for choosing Wehomatic.

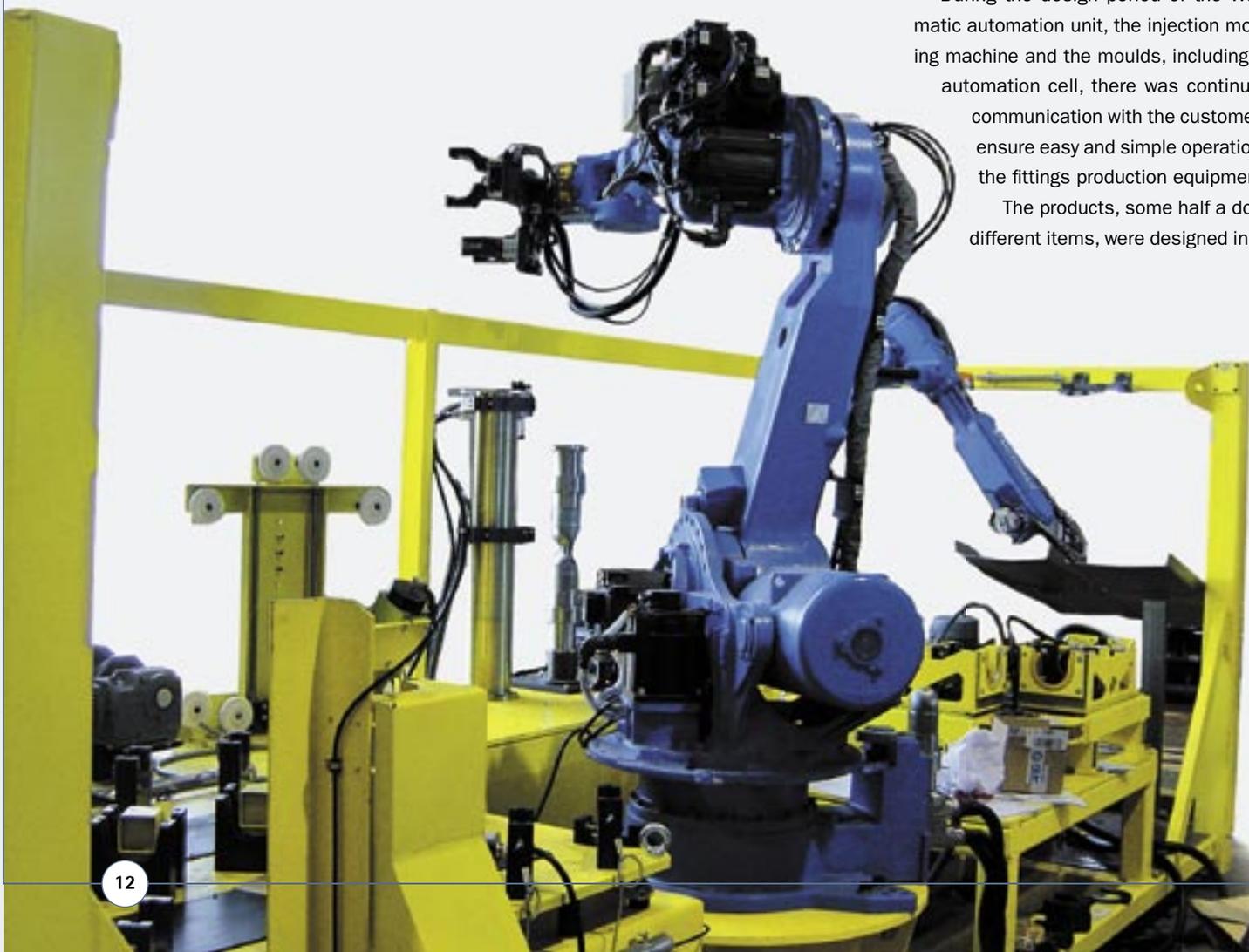
The production system of the Wehomatic unit turns out stress-free high-quality fittings, which meet the required standards even when using the very minimum wall thickness allowed. The production costs for the electrofusion fittings are so low that the unit has a "pay-back" time of less than one year, including all investment costs.

## **DESIGNED TOGETHER WITH THE CLIENT**

The KWH Pipe Fittings Production Systems Team designed the fittings together with the client.

During the design period of the Wehomatic automation unit, the injection moulding machine and the moulds, including the automation cell, there was continuous communication with the customer to ensure easy and simple operation of the fittings production equipment.

The products, some half a dozen different items, were designed in col-



laboration with the client, i.e. the client designed the external appearance of the items and KWH the technical details. This product development process took 4–5 weeks.

Drafts were sent to the client, whose alterations were taken into account whenever technically possible.

### **WORKING WITH THE VERY BEST**

The Wehomatic components were manufactured in collaboration with long-standing partners of KWH. During the manufacturing process, project managers and other engineering staff from KWH Pipe supervised and advised subcontractors constantly in order to reach the high quality required in each component and to complete the task within schedule.

The components manufactured by subcontractors were then assembled by KWH Pipe's own technicians.

### **TESTING, TESTING...**

Representatives of the client came to Finland during the equipment testing and proving period, which enabled them to familiarise themselves with the equipment in order to carry out any minor maintenance procedures that could arise.

Testing and final adjustments were implemented together with the client's operators for the purpose of providing training and sharing knowledge of the system with the client.

After the testing period, full-scale production runs were carried out in co-operation with the client. The full range of fittings were then manufactured to allow the client to check and approve the quality of each fitting as well as allowing him to confirm that the production rate was of an acceptable level.

After successful trial runs, the client gave final approval for the equipment to be released and installed in his production unit.

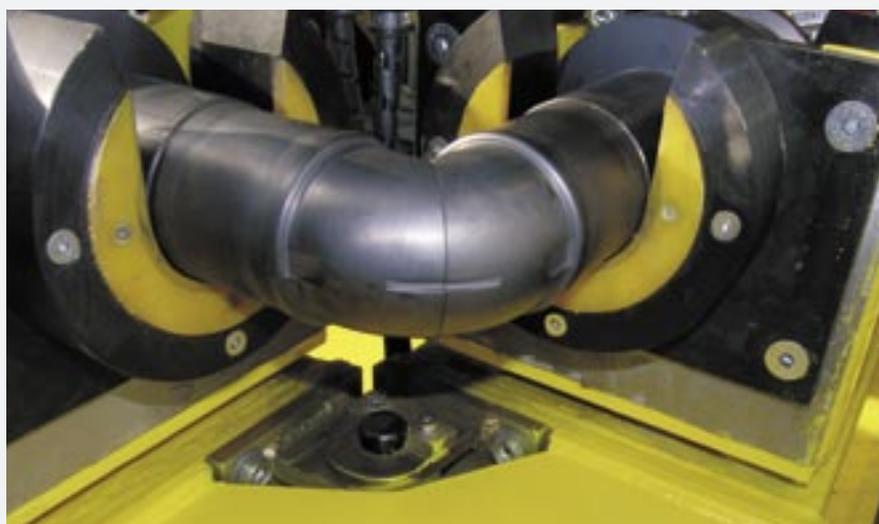
### **TRAINING FOR EVERYONE**

Final assembly at the customer's plant was carried out with the assistance of the cli-

ent's operators and at the same time final production training took place.

When the equipment arrived at the client's production unit, the equipment was re-assembled to ensure that no damage had occurred during transit.

Trial production runs to allow "fine-tuning" of the equipment took about two weeks and during that time, there was an opportunity to train further members of the client's production staff up to the required standard.



## **PRODUCTION COSTS FOR THE ELECTROFUSION FITTINGS ARE SO LOW THAT THE UNIT HAS A "PAY-BACK" TIME OF LESS THAN ONE YEAR.**

### **24/7**

The client now produces extremely high-quality electrofusion fittings.

The machinery runs automatically 24/7 with practically no human supervision. The total need for manpower is about 0.2 employees per shift. The output of the automation cell is 25–40 pieces per hour, that is, 200–250 tonnes a year.

The client can now produce fittings with lower production costs than would be possible using other automation cells on the market.

### **SIMPLE AS PUSHING A BUTTON**

Operating the Wehomatic automation cell is fairly simple. All that is needed is to confirm

that there is enough raw material to produce the fittings and then simply push a button.

The machine has its own alarm system, complete with siren and warning lights, but operators are advised to give the machine a brief inspection to ensure that everything is in order.

Even when the appliance was still in blueprint, a great deal of effort was put into ensuring easy maintenance and repair. All standard components were chosen for their global availability.

Specific parts are not generic and can be acquired from KWH Pipe, who also offer to check the appliance once a year as one would check a car. This service contract is particularly useful for smaller companies who do not have maintenance facilities of their own.

Wehomatic meets all the critical demands of today's clients, providing unparalleled output, sustained production quality, ease of operation and low production costs.

Wehomatic is supplied on a turnkey basis, yet tailored to the specific needs of the client. This is possible through client involvement at every stage of the making of the automation cell. ●



## District-heating pipes go into production in Kazakhstan

**KWH Pipe Technology has extensive experience in supplying production technology for PU insulated pipes all over the world. Most recently, district-heating pipe manufacturing technology was exported to Astana, the capital of Kazakhstan, in a 13-wagon train.**

Since the beginning of the 1990s, KWH Pipe has supplied a dozen district-heating pipe factories to places such as Poland, the Czech Republic, Russia and China. The most recent project was in Kazakhstan, where the client was TOO KZTI.

Trade fairs offer a good opportunity to make contact with clients, which is exactly what happened here.

“The first meeting took place in December 2004 and after rapid negotiations, the contract was signed in January 2005,” says Mr Johnny Jakobsen, Project Manager at KWH

Pipe Technology, recalling the sequence of events.

This year, KWH Pipe Technology is taking part in trade fairs in Russia, Ukraine and Kazakhstan.

### ALL ABOARD!

The contract includes all the main equipment a pipe manufacturer needs, and all the hands-on training required to operate it.

The goods for the Kazakhstan contract were ready for despatch in July 2005 and loaded onto a train 13 wagons long at the KWH Pipe Vaasa works in Finland. Blomberg Stevedoring, a KWH Group subsidiary, was in charge of the loading operation.

We prefer to reserve from a couple of weeks up to a month for transport. This allows the client enough time to take care of customs formalities.

“The client organizes some of the more simple parts of the equipment locally; for example it is not worthwhile bringing roller conveyors and working platforms all the way from Finland,” explains Johnny Jakobsen. The principal technical equipment is exported from Finland and the client supplements

it according to instructions. The factory layout is planned by the supplier, but the client is responsible for organizing the factory building.

“There are plenty of empty buildings in the target countries. To make them suitable for use, these old buildings often need modernization starting with heating, pipe work and electrical installations.”

### SUPERVISION AND TRAINING

Locals are responsible for installation in the factory, but installation instructions and supervisors come from Finland. There were four KWH employees engaged in the Kazakhstan installation. The installation work, carried out in August and September 2005, included commissioning equipment and training local staff.

The two-week basic training was given to the Kazakhstanis in Vaasa, but the fine-tuning of the two-part training period was taken care of in the Kazakhstan factory.

“In this case, the client was an experienced operator, so that training went without a hitch, but sometimes, the clients are a little less experienced,” points out Mr Jakobsen.

The client’s operations have got off to a good start and it is expanding production. This year, KWH Pipe will be supplying a production line for 1,200 mm PE pipe. •

### PRE-INSULATED PIPE PRODUCTION FOR ASTANA

- **Factory Name:** TOO KZTI  
(Kazakhstanskiy zavod trubnoi izolyacii)
- **Range of products:** PU insulated pipes DN65–DN700
- **Scope of supply:**
  - extrusion line for PE pipes up to 1,000 mm
  - equipment for insulation of straight pipe elements with PU
  - equipment for fittings manufacturing
  - machinery for pipe installation on site
  - quality control laboratory
- **Delivery from Vaasa in July 2005.**  
Commissioning of the plant took place in August/September 2005. Second delivery to take place in June 2006.



**Replacement of 3.36 kilometres of high-density polyethylene pipe is carried out under the PT Newmont Nusa Tenggara's management program following a leakage in September 2005.**

# Pipeline replacement

## at an open pit mine in Batu Hijau, Indonesia

The tailing pipeline is placed deep below sea level. The replacement process started in December last year and is expected to be ready in February 2006. The replacement will take the efforts of 170 people including local and overseas workers. The design and project procurement are handled by both national and international consultants.

Wiik & Hoeglund, the local KWH Pipe company, with previous experience in supplying PE-HD thick-walled pipe for PT Newmont Nusa Tenggara, were chosen as PE-HD pipe manufacturer and supplier for this project.

### THE BATU HIJAU MINE

The Batu Hijau is an open pit mine with associated processing and support facilities. Their product is copper concentrate containing small quantities of gold which is transported to local and foreign smelters for further processing. The project is located in the southwest region of the island of Sumbawa, Indonesia.

### PT NEWMONT NUSA TENGGARA

PT Newmont Nusa Tenggara is an Indonesian joint venture company owned 80% by Nusa Tenggara Partnership and 20% by PT Pukuafu Indah (Indonesia). It was formed in 1986 to explore a Contract of Work area located on Eastern NTB and eventually exploit it under contract to the Government of the Republic of Indonesia.



### BIG AND THICK PIPES

Tailings from PTNNT's copper-gold recovery plant are non-hazardous, non-toxic and chemically similar to the sand at the bottom of the sea around the island of Sumbawa. Tailings are finely ground rock left over after the valuable minerals have been removed. After a period of time, tailing pipes need to be changed due to abrasion from tailings. This means that thick pipe with good abrasion resistance, such as PE-HD, is suitable for this kind of application, since it will provide a longer service life than any other pipes, for example steel pipe.

PTNNT decided to use PE-HD pipe OD 48 inches (1,219 mm) with a wall thickness of 4 inches (101.6 mm). The pipes were

supplied in 15-metre lengths, a total of 244 lengths. They are manufactured from PE100 by using two large extruders. In order to depict the direction of extrusion, each colored line was to have an arrowhead painted on it. Pipe ends were also numbered in sequences of production to allow continuation throughout welding. Wiik & Hoeglund also supplied steel inserts to prevent ovality of the pipes during transportation. The total production process took some 2 months from start to finish.

The welding work was done by Polymer Fusion Technology, Australia, using welding parameters derived from Standard DVS 2207-1 and Standard INSTA 2074, suitable for such thick walled PE-HD pipe. ●

In a rock cavern excavated beneath Katri Vala park in the Sörnäinen district of Helsinki, a heat-pump plant is under construction that will produce not only district heating but district cooling as well. Excavation work for the installation started in summer 2004 and this major project is progressing according to plan. Work started with installing process pipework and machinery in late autumn 2005 and the plant will be in commercial use at the beginning of June 2006.

The Katri Vala plant will be fed by the Suvilahti seawater pumping station, which will be equipped with underground piping for seawater, constructed from Weholite polyethylene pipes.

"In the winter, seawater will be used for producing district cooling, and in the summer, for cooling the surplus heat energy produced by the heat-pump plant. In the summer, the heat will not necessarily go into the district heating network, but because the heat pumps produce heat continuously, the surplus will be conducted into the seawater,

if necessary," explains Mr Veijo Noponen, who is a process designer and installation supervisor at HelenEngineering, a subsidiary of Helsinki Energy.

"The seawater intake of the Hanasaari power plant runs nearby, but the old pipe was way too small for the volume of water needed by the new heat-pump plant, so we decided to build completely new pipelines for the seawater," continues Mr Noponen.

To begin with, the pipeline that is now under construction will only serve the Katri Vala heat-pump plant and carry a maximum flow of 11,100 cubic metres of water per hour.

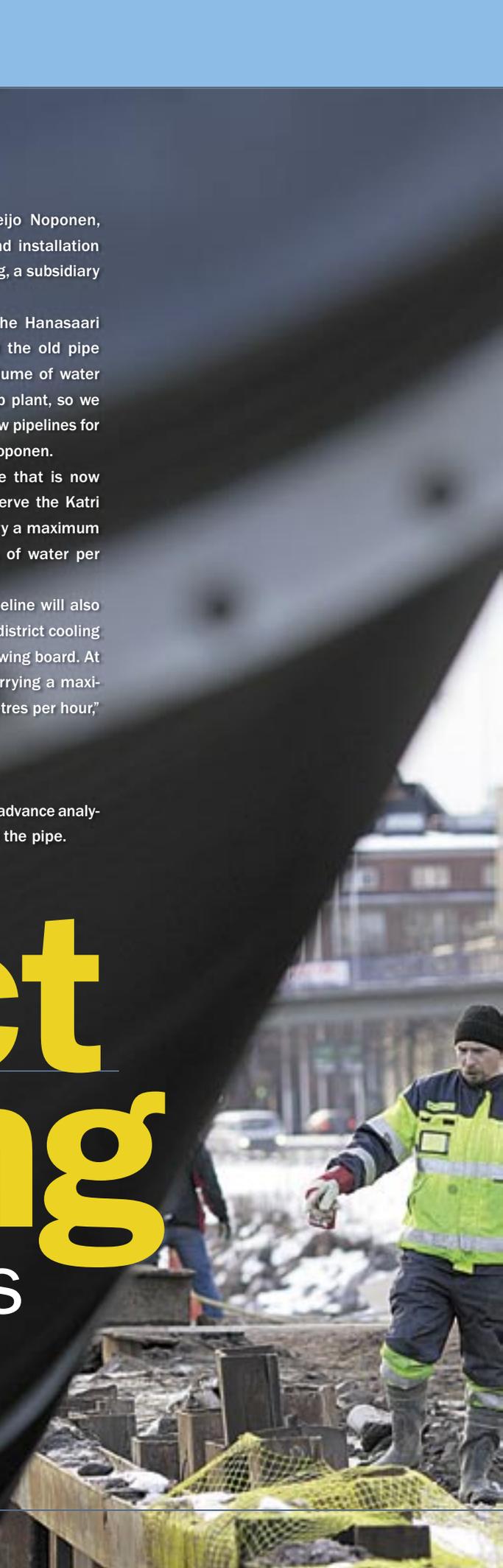
"Later on, by 2020, the pipeline will also serve the Suvilahti and Pasila district cooling plants that are now on the drawing board. At that stage, the pipe will be carrying a maximum flow of 27,500 cubic metres per hour," estimates Mr Noponen.

#### LONG-TERM SOLUTION

Helsinki Energy made a careful advance analysis of alternative materials for the pipe.

# District cooling with large pipes

Helsinki Energy is laying pipes deep in the ground for its new heat-pump plant in Helsinki, Finland.





“First we took a look at solutions using concrete pipe, GRP pipe, and acid-resistant steel pipe. However, Weholite was the most competitive in terms of price and the most long-lasting in terms of lifecycle. The pipe has to last at least as long as the heat-pump plant is in operation, i.e. around 25–30 years. I was already very familiar with the material and jointing methods used for Weholite pipe,” says Mr Noponen, summing up the selection criteria.

Helsinki Energy had previously used the same type of PE pipe supplied by KWH Pipe for the underground seawater pipelines of the Salmisaari cooling centre. The pipe has now been in use for five years.

#### **AWKWARD EXCAVATION CONTRACT**

KWH Pipe was in charge of installing the DN/ID 2,000 mm pipes in the trenches and welding them together. The phases of the work were carefully planned in advance together with Helsinki Energy. Planning started in spring 2005 after tender action was completed in February–March. Permits for excavating the pipe trenches were obtained from the Helsinki Environment Centre.

According to Mr Noponen, the most difficult phase of the contract was the excavation, for two reasons.

“This is where the old Helsinki gasworks used to be located. We knew in advance from the analyses that there is polluted ground in the area, but we couldn’t imagine there would be quite so much of it. We take samples from the spoil that is dug up and the most contaminated soil is carted away for treatment at a hazardous waste disposal plant a hundred kilometres away.”

The ground is densely built up and filled with large district-heating ducts, main service runs and cables.

“Something of great help to us in planning the lines of the pipes was the utility

map maintained by the Survey Division at the City of Helsinki Real Estate Department. It shows all the underground cables and pipelines and is always updated whenever any telephone or electric cables, district heating or cooling mains, or sewers or water mains are constructed,” explains Mr Noponen.



“Because of the ground, the excavation work was tricky, but when the trenches were ready the pipes went in surprisingly quickly,” says Mr Veijo Noponen of Helsinki Energy.

Once it had been decided where the pipes would run, the Geotechnical Division at the City of Helsinki Real Estate Department drew up a foundation plan for the groundworks of the pipe trenches. The subsoil in Hanasaari consists of made-up ground on top of the old sea bed.

The pipe trenches had to be about 4 metres wide and more than 5 metres deep, and the base of the excavation had to be at a level of –2.98, considerably below sea level. A gravel bed was laid below the pipe. The excavation had to be sheet-piled to a depth of 10 metres for its entire length so that more than a kilometre of sheet piling was driven in at the edges of the trench. The filter basin on the supply pipe from the sea also had to be sheet-piled during construction.

The groundworks contract was awarded to Niska & Nyysönen and the groundworks were launched early in September.

Installation work on the supply and return pipes began in mid-November and the installation of the underground section was



(On the left) One of the fitters, Mr Mikko Knuuttila (left foreground), was in charge of the installation work. The entire supply pipe was installed by the end of January and work started on the installation of the return pipe immediately after the supply pipe was completed. The excavation work was completed in February.

The seams were welded inside the 2,000-mm pipe, sheltered from wind and snow.

completed by the beginning of March. There were two pipe fitters working on site permanently, but they were joined by another team of two as the need arose.

“Carting the spoil away for treatment has delayed the overall timetable by a few months. Although the work has had to be done at a less favourable time of year, it hasn’t affected our own work at all and hasn’t resulted in any increased costs for the client,” says Mr Ari Vaarala, Operations Manager at KWH Pipe, with emphasis.

### RAPID RESULTS

The pipes are weighted down with concrete so that they stay in place regardless of rising water levels.

“The weighting percentage is about 10% of the full buoyancy. The pipe has a structured wall, so one section in six is pumped full of concrete. The external dimension of the pipe does not increase and the internal dimension does not decrease, yet the weight remains within the pipe profile,” points out Mr Vaarala.

The return pipe is fitted with a prefabricated Z-bend, which is used to drop the level of the pipeline 80 cm in the underpass at Parrukatu street.

The cover for the pipeline is 2.5–3.0 metres.

### THE PIPES WERE WEIGHTED DOWN BY PUMPING EVERY SIXTH SECTION FULL OF CONCRETE.



#### PIPE DELIVERIES

- The pipe used was Weholite DN/ID 2,000 mm, 1.5 bar.
- The length of the pipeline is about 600 metres.

“Because of the other pipelines and cables, we couldn’t lay the pipes any closer to the surface, and the supply pipe had to be below sea level in any case,” explains Mr Noponen.

In January, most of the pipe that was going to be installed was in store either at the factory or on site. Precise measurements

were still needed to manufacture the outfall end of the return pipe, but apart from that, the fabrication of all the pipes and components was completed in January.

The pipes were joined by welding, which is a safe and sure method, especially for large-diameter pipes. When welded, the pipe joints were filled with the same kind of plastic the pipes were made of, but in molten form.

Usually, the work progressed at a rate of two joints per day.

“The welding is done inside the pipe which still has a plug at one end, so you have built-in weather protection. With any other jointing method you need separate weather protection at each joint,” points out Mr Vaarala.

“The speed of installation of KWH Pipe surprised me as soon as the excavations were completed,” says Mr Noponen with a nod and a smile.

Work is still continuing on site. Three separate intake pipes were installed on the seabed in front of the supply pipe filter basin in late April or in early May. On the other side of the Hanasaari power station site, a 2-metre-diameter 90° bend was installed with an anchoring collar. The bend was fixed to the inner harbour quay to form the return pipe outfall. ●

# Super Reels for gas pipe

– Industry partnerships make good ideas happen

“What if...” – these two words usher in new ideas, providing innovative products and increased profitability for those who seek a commitment to new ideas.

Inspiration can come by viewing new projects in other countries. In this case, it was a visit to France by an engineer from Quebec-based Gaz Métro.

Looking for ways to improve cost-effectiveness of the pipe installation process, Gaz Métro, a distributor of natural gas throughout Quebec and Vermont, saw an opportunity in Super Reels. During gas pipe installation, Gaz de France was observed using a trencher to excavate the soil, followed by a huge spool carrying the gas pipe. A trencher was obtained by Gaz Métro for traditional installation of 40 ft (12.2 metres) of lengths, however the availability of larger reels of pipe would greatly speed up the installation process.

Back home in Canada, Gaz Métro searched for a manufacturer who could supply 4" (101.6 mm) and 6" (152.4 mm) gas pipe packaged on these Super Reels. KWH Pipe was their steady supplier of WehoGas pipe; a long and solid business relationship between the two companies made the choice for this venture easy.

Development of the new packaging alternative was exciting and challenging. Working as a partnership, Gaz Métro's engineers approved the plans and reviewed the speci-

**Commitment to innovation brought this venture to completion: put factory modifications in place, designed pipe carriers and created the transportation infrastructure to make the Super Reels concept such a success.**

**WORKING CREWS CAN NOW WORK TWICE AS FAST, DOUBLING THEIR PRODUCTIVITY AT THE SITE.**

fications, while KWH modified their plant so the pipe could be efficiently coiled onto the larger reels. Special steel reels were designed to hold the new lengths of pipe. A transportation partner designed a new trailer, allowing the efficient transport of these gigantic Super Reels.

Since Gaz Métro relies on the short Canadian summer months to lay gas pipe, there was a July deadline to have the steel reels made, the pipe produced onto the steel reels, and the transport trailers completed. The entire project took about one year and was ready for the summer construction season.

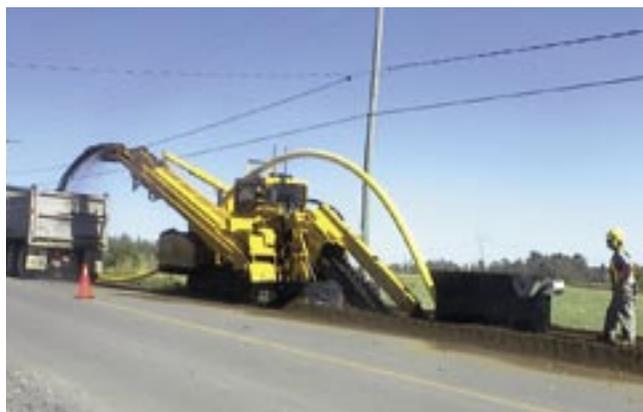
## DOUBLE INSTALLATION SPEED

Previously, 4" and 6" WehoGas pipe was transported in 40 foot lengths, therefore field fusion joints had to be made every 40 feet, which limits the trenchers installation speed. Super Reels is now greatly valued

the industry, as longer lengths mean further distances during installation with less manpower. With Super Reels, installation of longer lengths of pipe is commonplace. In the case of 4" pipe, the Super Reel allows 2,428 ft (740 metres) to be reeled. With 6" pipe, the Super Reel allows 1,214 ft (370 metres) to be reeled.

Gaz Métro promotes the use of a trencher in long-length projects (3 km and up), soil conditions permitting. Super Reel has so many advantages that even without the trencher, it is proving to be a valuable investment and a great success. Installation contractors request Super Reels because they enjoy an increase in productivity and reduction in labour costs.

The reduction in field fusions resulting from the use of the Super Reel are a revolution for the working crews who have to rethink their way of laying down pipe. They can now work twice as fast – instead of laying 400 to 500 metres per day, they can now lay 1 kilometre, doubling their productivity at the site. ●





The sludge created by the drilling is pumped away and the pipes in the underpass can be connected to the standard network.

# How to bend a district heating pipe

**In the Swedish town of Örnsköldsvik, directional drilling was used to lay large Wehotherm district heating pipe elements in 200-metre lengths below the Moälven river bed.**

Over the last few years, work has been carried out in the town of Örnsköldsvik that will spare the environment and save money for the town's residents. Earlier, there were several small regional heating plants, but now heat generation for residential areas will be centralized in a large, efficient and environmentally friendly thermal power plant.

The new two-kilometre bicycle and pedestrian route was built on top of the district heating pipeline.

"We saved more than 100,000 euros of taxpayers' money compared with constructing the route separately," explains Mr Eine Ögren, Project Manager at Övik Energi.

Övik Energi built more than 4 kilometres

of new district heating pipeline, which used almost 10 kilometres of district heating elements. The energy company chose the element supplier for the project themselves; after the competitive tendering process, KWH Pipe Thermopipe was selected as partner.

## DIRECTIONAL DRILLING WORKS

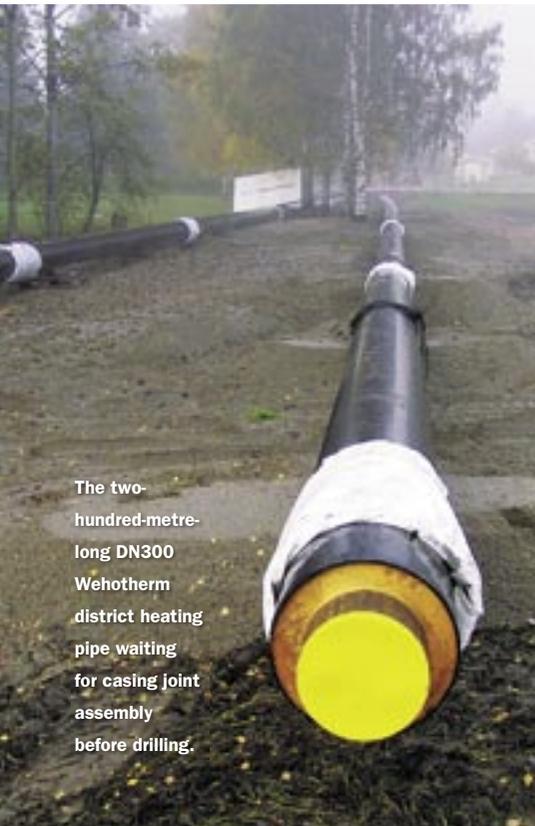
The project was complicated because the pipeline had to cross the Moälven river. Övik Energi, together with the project consultant and other partners, considered two options: building a bridge across the river or submerging the pipe underneath the river. "We concluded that directional drilling would be the best and cheapest option. We

constructed two tunnels, about 200 metres long, under the river, through which the flow and return pipes were pulled. The pipes run at least 4–5 metres underneath the river bed and at their deepest, some 20 metres below ground level," explains Mr Ögren.

Exact calculations were needed to get the large pipes to bend under the river.

"Large Wehotherm district heating elements have never before been laid at such a depth with a directional drill," explains Mr Gunnar Lärka, Sales Manager of KWH Thermopipe's Norrland region, who was in charge of the practical aspects of the delivery.

The district heating elements consist of a steel pipe surrounded by polyurethane foam as heat insulation and, on top of that, by an external PE casing. The pipes from the Vaasa factory were delivered to Örnsköldsvik in 16-metre lengths and welded together on site into two 200-metre pipes.



The two-hundred-metre-long DN300 Wehothem district heating pipe waiting for casing joint assembly before drilling.

## DISTRICT HEATING PROJECT

- Övik Energy had some 4 km of new district heating network constructed.
- The district heating pipeline connects the Själebad area to a large district heating power plant.
- At the same time, a new bicycle and pedestrian route nearly 2 km long was built on top of the pipeline.
- KWH Thermopipe supplied DN250/450 and DN300/500 Wehothem elements.
- An underpass was built below the Moälven river. Pipes were pulled underground by directional drilling for a distance of about 200 metres. At their deepest, the pipes run 20 metres below ground level.
- The main contractor was Skanska.
- Sub-contractors were YIT Projektör for the pipe work, Mittel for the sleeve work and Styrud Ingenjör for the directional drilling.
- The consultants used by the developer were WSP, GC Väg and Eurocon.

“Casing joints were made with electrofusion sockets and insulated with polyurethane foam. An additional PE sleeve was shrunk onto the finished connection so that the threshold of the connecting section was as flat and smooth as possible. This made pulling the pipe into place as easy as possible,” explains Mr Lärka.

### CONSTRUCTING THE PIPE UNDERPASS WENT SMOOTHLY

The provincial government did not allow work to be carried out on the river between mid-August and mid-October, when migratory fish return from the headwaters to the sea for winter.

“The project started in May and continued until early December, so we were able to schedule the work so that this did not affect the timetable,” says Mr Ögren.

The directional drilling, construction of the pipe tunnels and pulling the pipes through went smoothly, and only took about 10 hours.

“The work had to be well-planned because the river is much deeper on one bank than the other and there was solid rock in places below the river quite close to the bed. Taking all these factors into account we decided to make a U shape, the ends roughly 200 metres from each other. This stage of the project was carried out at the start of November,” explains Mr Ögren.

The directional drilling firstly involved

making two small alignment holes under the river, to ensure that the ends of both flow and return pipes came out at the right spot. Then a spray drill was sent along the directional holes. It sprayed betonite onto the mud layer to harden the edges of the tunnel. When the tunnel was ready, the long pipe was pulled into place with the drill. Finally, the heads of the pipes were connected by welding to the network on both banks.

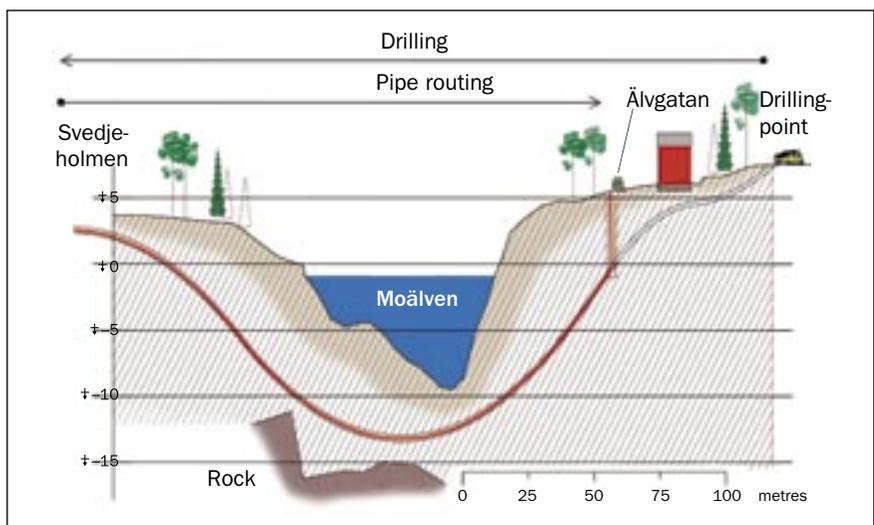
Thanks to directional drilling, no visible traces of the work were left on the banks of the Moälven river. Thus there was no need to landscape the site after the project.

### YEARS OF COOPERATION

The new main pipeline, which is more than four kilometres long, cost Övik Energy some EUR 830,000. Ögren thanks KWH Pipe for their first-rate cooperation.

Övik Energy and KWH Pipe began working together in 2000 and nearly 15 kilometres of pipeline from KWH Pipe’s factories have been delivered to Örnköldsvik. Work to centralize district heat production and to bring new areas into the district heating network as well as work to bring district cooling to non-residential properties continue in Örnköldsvik.

“I believe that KWH Pipe will be involved in projects in Örnköldsvik in the future too,” said Mr Gunnar Lärka on the smooth cooperation between the companies. ●



Directional drilling under the Moälven river (scale height: length 5:1).



The Vejle housing centre is a public institution for people with disabilities and is under the administration of the County Council of Vejle, Denmark.

Until recently, its wastewater was discharged directly into the environment, cleaned only by a sand filter plant. Following a market survey to find the best solution in terms of quality of treated wastewater, ease of installation, daily running and maintenance – and, of course, price – the choice fell on the WehoPuts wastewater treatment plant, developed by KWH Pipe and sold by Kongsted Maskinfabrik in Rønnede. This was the first treatment plant of its kind to be installed in Denmark.

body of water is not burdened with nutrient salts, something that normally increases the risk of oxygen depletion in Danish lakes and rivers.

The WehoPuts plant is made up of many different parts in order to make all these processes function: tanks, pipes, pumps, vents, electronic monitoring equipment – in fact, the plant has PLC control and a GSM module for wireless monitoring and alarms – and a lot more besides. The WehoPuts plant is assembled and prepared for operation at the factory and delivered as a complete unit, ready to be installed and switched on in just one day. The only preparatory work done at the centre was a trench for the plant that was planned

# Wastewater treatment plant

**Housing centre for about 70 people equipped with environmentally friendly wastewater treatment.**



**From single household to village community, KWH Pipe supplies plants treating the wastewater. There is always a simple, effective and environmentally sound method available for dealing with wastewater.**

WehoPuts is a bio-chemical treatment plant. Independent studies have shown that the quality of the treated wastewater is fully on a par with the best municipal wastewater treatment plants.

### **SMALL BUT CLEVER**

According to Mr Ulf Zinn, Sales and Product Manager at KWH Pipe in Denmark, the WehoPuts wastewater treatment plant does not just remove organic matter (BOD) from the wastewater – WehoPuts plants are designed to perform both nitrification (conversion of harmful ammonia into nitrates) and denitrification (conversion of nitrates into free nitrogen). This is unique for a treatment plant of this size. WehoPuts plants are also designed to separate phosphorus from wastewater through chemical precipitation. All the above processes ensure that the recipient

and dug in advance. Sewer pipes to be connected to the plant had also been exposed. So, despite an unexpected winter snowfall on the day of the installation and the ensuing weather-related traffic delays, the new wastewater treatment plant was installed and ready for use by the evening of that same day. Backfilling and landscaping had to wait a day or two due to the wintry weather.

The plant now in use in Vejle treats 10 m<sup>3</sup> wastewater in 24 hours, the equivalent of the wastewater produced by roughly 70 people. The external dimensions of this particular plant are just over 10 metres in length and 2.60 metres in diameter. The tops of the tank covers and the ventilation pipes – the only visible parts of the plants once it has been installed – give the plant a total height of about 3.60 metres, of which at least 2.80 metres are underground. ●

**Muuga Harbour, near Tallinn, Estonia, is the seat of activity for a number of oil transshipment companies, among them Eurodek Synergy AS. In 2004, Eurodek began construction of a pipeline from the oil pier to its tanks, and approximately 360 metres of this was built using preinsulated DN600/800 pipe.**



# From pier to tank

## in Muuga Harbour, Estonia

The pipeline was designed by the Finnish company PI Rauma and the pre-insulated pipes were supplied by KWH Thermopipe.

The preinsulated section of the pipeline is located beneath the platform quite close to water level. To protect the pipes from ice, the entire pipeline is protected by a strong, waterproof metal casing fixed 20–30 cm above water level.

The DN600 pipes are 18 metres long with a PE casing that is 800 mm in diameter. The thermal insulation layer has six aluminium profiles against a carrier pipe for heating cables. The pipeline also has elbows of the same construction. Casing joints are insulated with PUR foam and sealed with shrinkable PE sockets.

The pipes were shipped from the Vaasa factory to the Tallinn company Kohimo AS, one of the largest steel construction firms in Estonia. They produced the steel casing which protects the pipes. These 18-tonne sections were then shipped to Muuga Harbour.

KWH Pipe Eesti AS took part in the construction of the pipeline. The project included lengthening the elbows to meet project dimensions, connecting the pipeline's leak detection wires and installing the heating cables and casing joints. The extended elbows were also 'packed' into the metal casing.

The sections of the piping system were transported under the oil pier on pontoons, where they were attached to the concrete structures.

Assembly of the pipeline depended largely on prevailing weather conditions. Muuga Harbour is open to the sea, and even waves measuring only 0.5-metres high made it impossible to get any work done. The job was completed in the summer of 2005.

On-site technical support was provided by Mr Jan-Erik Svarven (KWH Thermopipe) and Mr Bo Jonsson (CWA System AB). •

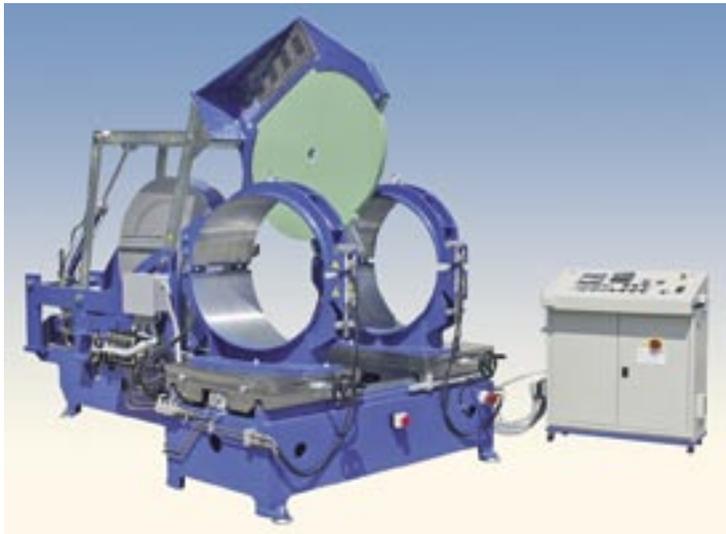
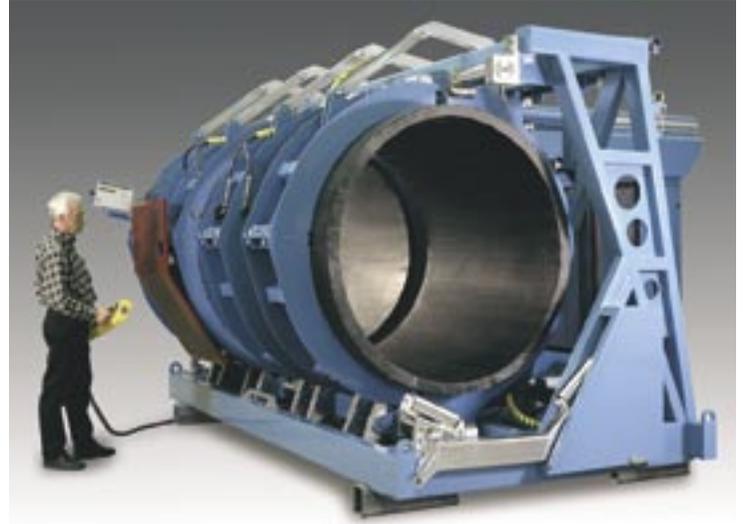


# PE and PP welding machines from KWH Tech

*The products and services of KWH Pipe Technology and its subsidiary KWH Tech GmbH complement KWH Pipe Group's core operations and support big pipe projects worldwide.*

*The standard range of products includes manual and semi-automatic butt fusion welding equipment (20 – 1600 mm) for on-site use and for the production of fittings in the workshop, band saws and apparatus for the supervision of welding quality and the control of welding parameters.*

*Since the 1960s, KWH has delivered thousands of welding and special machines to customers all over the world. One of the operating principles is to find strong partners in foreign markets and to create a successful distribution network.*



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M e m b e r o f t h e K W H G r o u p