



WASTEWATER TREATMENT IN RURAL AREAS

Welder training in St. Petersburg | Coating steel pipe joints in the field

PIPE WORLD – THE KWH PIPE CUSTOMER JOURNAL

Our products carry on where municipal engineering stops



WehoSeptic

Subsurface wastewater treatment systems

Treatment solutions for domestic wastewater



WehoSeptic 2000-2 soil filtration system

For the treatment of all domestic wastewater

WehoSeptic 300 sauna drain



Treatment system for sauna washing water using carried water. Holes have already been punched in the base.

Wastewater systems for holiday homes



WehoSeptic 1000-1 absorption system

For the treatment of kitchen wastewater and greywater from the sauna at summer cottages with mains water supply

Separating dry toilet



Odourless and modern toilet solution with a ventilator.

WehoPuts®

Domestic wastewater treatment plants

- Excellent treatment results
- Quick and easy to install
- The complete solution
- No need for a vacuum tanker to empty the plant





Our commitments define our actions

Climate change, a constant topic in public debate recently, is an example of how human activities have an impact on the environment. We also worry about the availability of fresh water, the treatment of wastewater and the eutrophication of our waterways. Many of these impacts affect a large number of people, and some are worldwide concerns.

The most efficient, and indeed the only way of combating adverse environmental effects is to reduce or remove local loads on the environment.

Often the actions needed to save the environment are small ones. Simply by re-evaluating your consumer habits and by changing them you can achieve tangible results to improve your immediate surroundings. This is why all of us must take action and make a commitment.

By cooperating actively with our customers and investing heavily in technology needed for water supply and wastewater management in sparsely populated areas, KWH Pipe has been successful in developing new products. These areas are typically low in population and located far from large conurbations, and cannot be linked cost-effectively to larger networks.

New environmental products include low-level water tanks for drinking water and small installations for alkalization. Domestic wastewater treatment plants for single households form a product group of their own.

Environmental technology will continue to play a major role at KWH Pipe. We are committed to improving our technology and to seeking innovative, cost-effective product solutions to minimize and prevent adverse environmental effects.

Juha Kainulainen
Business Area Manager
Environmental Products, Europe

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PIPE WORLD

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An uplifting prefab job

| KWH PIPE'S PREFABRICATION departments have mastered the art of creating fittings, chambers and tanks from polyethylene pipes. Prefabricated products can be made according to customer specifications for virtually any application. Some requests are more innovative than others. The NorEst company in Gothenburg, Sweden, uses pontoons that have been prefabricated with Weholite pipes for their boat lifts.

AeroLift lifts boats out of the water, thus protecting them from corrosion and algae growth. This reduces the need for maintenance, minimizes harm to the environment and increases the resale value of the boat. The boat lift is lowered by filling the pontoons with sea water. When the pontoons are filled with air, the natural buoyancy of the plastic pipes lifts the boat.

Weholite pipes have proven to be an excellent material for the pontoons as they are durable, corrosion-resistant, environmentally-friendly and they have high ring stiffness and a long lifetime.



Durable and easy-to-use pontoons are a new application for Weholite pipes.

Lithuanian website has been launched

| LITHUANIAN CUSTOMERS are now provided information on pipe systems in their own language 24 hours a day – 7 days a week. The newly-established sales office in the nation's capital, Vilnius, has been welcomed by customers looking for high-quality products and specialist knowledge. It is constantly looking to improve its services and, as a result, has now launched its own website.

Please visit www.kwhpipe.lt for more information!

Swedish premiere for fast cut drilling

| "THIS METHOD could be big in the future," says Niklas Rydgren. Niklas works for KWH Pipe in Sweden and he is pressurizing the drill, which is about to drill a hole in an existing pipeline that will be connected to a new pipeline using a branch saddle.

Once the pipeline is in place, the customer, SPS Entreprenad, is pleased with the way in which the project has been carried out.

The principle of the method is that you work in a sluice valve and do not need to reduce the pressure in the existing pipeline. This means huge advantages for the customer and occupiers of nearby houses as the water supply can continue uninterrupted.

KWH Pipe is the first pipework supplier in Sweden to offer these services to their customers. The method will be presented at several exhibitions throughout autumn 2007.

APPOINTMENTS



KWH Pipe Holding

Mr **Gunnar Blomqvist**, B.Sc. (Eng.), has been appointed Manager, Production Coordination in the KWH Pipe Group as of January 1, 2007. Mr Blomqvist has previously worked as Factory Manager at the Vaasa factory.



KWH Pipe Canada

Mr **Sandeep Dhillon**, MBA, CA, has been appointed Chief Financial Officer, Executive Vice President of KWH Pipe (Canada) Ltd. Mr Dhillon has previously worked as Director of Finance and Administration at KWH Pipe (Canada) Ltd.



KWH Pipe Finland

Mr **Rune Svenfelt**, M.Sc. (Chem.), has been appointed Factory Manager of the plant in Vaasa, Finland, as of January 1, 2007. Mr Svenfelt has previously worked as Project Engineer at the Vaasa factory.



Environmental Products

Mr **Jan Hägg**, has been appointed Product Manager, Environmental Products, as of January 1, 2007. Mr Hägg is responsible for product preparation.



KWH Pipe Sweden

Mr **Per Jansson** has been appointed Market Technician as of November 27, 2006. Among other tasks Mr Jansson is responsible for product preparation.



KWH Pipe Technology

Mr **Kari Punnonen**, M.Sc. (Eng.), has been appointed Director for the Tech Vaasa Unit as of January 1, 2007. Mr Punnonen has previously worked at Wärtsilä Biopower Ltd.

wehoputs.com now also available for customers in Sweden

| **WEHOPUTS** domestic wastewater treatment plants treat and clean sewage for single households or smaller communities. They are reliable, easy to use and offer excellent treatment results. WehoPuts is the most popular treatment plant on the Finnish market and has now recently been introduced to the Swedish market.

The wehoputs.com website has previously only provided in-depth information about the WehoPuts products in Finnish, but it is now also available in Swedish to satisfy the information needs of Swedish consumers.

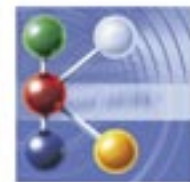


For information on WehoPuts in both Finland and Sweden, please visit www.wehoputs.com!

Welcome to Düsseldorf!

| **KWH PIPE WILL TAKE PART** in K 2007, the 17th International Trade Fair for Plastics and Rubber in Düsseldorf, Germany. K 2007 will be taking place at the Düsseldorf Trade Fair Grounds October 24–31 and it is expecting more than 200,000 visitors from all around the world.

**KWH Pipe's stand number is 11F26.
Please feel free to visit us!**



K 2007

International Trade Fair
No. 1 for Plastics
and Rubber Worldwide

**TURNING VISION
INTO BUSINESS**

Düsseldorf

24 - 31 October 2007

www.k-online.de



Photo: Messe Düsseldorf

An attractive development was sealed by agreement on January 1, 2007: KWH Pipe Denmark acquired the assets of Kongsted Maskinfabrik, developer and producer of biological domestic wastewater treatment plants, filtering systems and pump chambers.

“KWH Pipe Denmark has grown rapidly after bringing many of our functions under one roof in Svanninge. The acquisition of the business of Kongsted Maskinfabrik is both a natural further step in our expansion and also a future-oriented investment,” says marketing manager Hans-Kristian Høen-Beck of KWH Pipe.

“We hope to create a higher environmental profile with a wider range of products to complement our pipe systems. The products of Kongsted Maskinfabrik, now renamed WehoMini, have been approved under the strict Danish SO and SOP environmental criteria. Type-approved wastewater treatment systems have a strong synergy connection with our goal of expanding our product range into the environmental sector.”

Hans-Kristian Høen-Beck is supported by managing director Jens Olesen. He says that in recent years, the company

Dynamic and biodynamic

A leading producer of pipe systems with its eye on the dynamic environmental sector has enhanced its competitiveness by acquiring a business with expertise in biological domestic wastewater treatment plants.



“We could grow no further on our own. The asset deal with KWH Pipe opens new opportunities for us. It was a win/win situation,” says Brian Lang (on the right). “The acquisition of Kongsted Maskinfabrik’s assets is both a natural further step in our expansion and also a future-oriented investment,” adds Hans-Kristian Høen-Beck.

has sought to expand its product range to meet customers' requirements for additional products to complement the pipe systems.

"We considered the products of Kongsted Maskinfabrik to be of such a high quality both technically and in terms of competitiveness that they lived up to our current high standards very well. We are happy to have gained the products and the rights of Kongsted Maskinfabrik together with the expertise of its 16 employees."

BRIGHT FUTURE

"We could grow no further on our own. The asset deal with KWH Pipe opens new opportunities for us. It was a win/win situation," stresses Brian Lang, who was managing director of Kongsted Maskinfabrik and who is now overseeing the integration of Kongsted products with the KWH Pipe product portfolio and also has responsibility for export sales.

All 16 employees at Kongsted Maskinfabrik have been invited to relocate to KWH Pipe's factory in Svinninge, and most of them have agreed despite the fact they will have to commute further.

"It is a very positive development for us, and we are expecting a lot from this collaboration," Hans-Kristian Høen-Beck says. He says that the deal opens up the very interesting Norwegian market for the company.

"The products support our ambitions to expand in Scandinavia with a more diverse product range, and wastewater treatment fits in well with our aim of growing in the environmental sector."

WehoMini has also been certified by the certification body Det Norske Veritas.

"Those approvals are highly demanding and expensive to attain. Kongsted has been developing and installing wastewater treatment systems for many years, and now it has the backing of KWH Pipe's organization and support to grow on existing and new markets," Brian Lang says.

"There is a bright future for wastewater treatment systems, and with KWH Pipe's

customer base we have much better opportunities for increasing production and sales, in new areas in Denmark but in Norway also, where we have gained highly demanding type approval certification. Without type approval, it is impossible to sell this kind of system, and we are rather proud that we have managed to produce the demanding documentation of effectiveness that was required."

Brian Lang is now responsible for exports of the WehoMini biological wastewater treatment plants, and he sees

ple, chambers and tanks, and it fits nicely with the acquisition of Kongsted Maskinfabrik, says Hans-Kristian Høen-Beck.

"Apart from our wastewater treatment plants, we have all the components needed for wastewater treatment, such as pressure pipes, gravity pipes, inspection chambers, individual wastewater pump systems for single-family houses, metering chambers, ventilation chambers and the necessary connections. We consider ourselves a full-service supplier with regard to the products of our pipe factory in Middel-



Kongsted Maskinfabrik is a full-service supplier with a wide range of products: the selection of PE pipes alone include 200 sizes, ranging from 20 mm diameter to 1,400 mm diameter.

Northern Europe and possibly also the Baltic states as potential markets.

"But Eastern European markets with great potential for the future are close too. It will take some time, however, before those markets mature, in terms of treatment requirements and investment volumes," he says.

PRODUCTION LINES

KWH Pipe has purchased a rotational moulding machine which makes it possible for the company to manufacture large tanks.

"It is a really big installation, and it will have a hall to itself in the 7,000 square metre premises we have in Svinninge. Things are going well for KWH Pipe in Denmark, and we needed more space. The increased capacity is being used partly to augment our own production of, for exam-

ple, which include PE pipes in more than 200 sizes, from 20 mm diameter to 1,400 mm diameter. We are the only company in Denmark that can deliver gravity pipes and pipes for rainwater tanks, chambers and so on at sizes of up to 3,000 mm diameter. Customized prefabrication of fittings and chambers is carried out at our production workshop in Svinninge, and the WehoMini production line will be housed there too. We have a solution-oriented strategy aimed at providing a one-stop shop for our customers," Hans-Kristian Høen-Beck says, while noting that KWH Pipe has noticed an increasing interest in environmental products.


"It is a bit early to say that municipal investments are booming as a result of the local government reform here in Denmark. But it is a fact that there is a veritable boom in geothermal heating systems." ●



Nature at its purest at

Hahkiala Manor

Hahkiala Manor stands in a location of natural beauty in the village of Hauho, Finland. The exceptional manor milieu, which today offers conference and tourism services, is kept clean with domestic wastewater treatment plants.



The French-style garden at Hahkiala was laid out by Chancellor of Justice Dr Axel Charpentier. In recent years, it has been restored to its original splendour. It was decided that all renovation should be done in one go so that the yard only needs to be dug up once.

Aristocratic and atmospheric, Hahkiala Manor is straight out of a history book. The 480-hectare estate is commanded by the manor house built in what is known as modified Swedish Baroque style in 1915–1917. The Hahkiala estate was originally a fief of the Tawast family in the late 15th century and for the whole of the 16th. In 1651, the estate was bestowed upon Toussaint Charpentier, a native of Normandy, France, who had fought with distinction in the Swedish army in the Thirty Years War. The Charpentier family held the manor up until 1963. The estate remains privately owned.

FOOD AND FUN

Hahkiala Manor is an attractive setting for a variety of functions. Its hospitality has extended to presidents and other notables in the course of its history.

“We have between 450 and 500 guests every month. Corporate groups are our largest customers,” says Karl Fazer, the owner of the manor.

The manor has witnessed memorable seminars, courses, product launches, anniversaries, personnel outings and reward ceremonies.

Hahkiala Manor has 12 different rooms that can cater to groups between 6 and 80 people and has state-of-the-art audiovisual equipment.

“We can accommodate 40 people at one time, and in a typical month we log 300 overnights. Only one group is accommodated at any one time. The idea is that in this way friends or colleagues can feel at home,” says Karl Fazer, and hostess Carita Sarin agrees.


The natural beauty of the environment and the nearby Lake Kirrinen allow guests

to enjoy a wide range of pursuits such as cross-country skiing, ice fishing, sailing, clay pigeon shooting, hiking or horseback riding. The manor also organizes jeep and quad bike safaris, canoe trips and rides on a horse and cart. To round off the day, there is the sauna on the lake shore, with a dip in a hole in the ice or a water-filled wine butt for the more adventurous. And to crown it all, the manor kitchen offers a gourmet meal with seasonal treats. Menus are tailored to the customer’s wishes. The manor specialties include game and seafood.

RENOVATED IN ONE GO

Major changes were made at Hahkiala in 2006. In the autumn, two domestic wastewater treatment plants were installed in the grounds (WehoPuts 70 and WehoPuts 80). This coincided with the replacement of the heating pipes. The manor is building a 500 kW power plant for burning wood chips and surplus grain, with a view to providing heating for all the buildings on the premises. As the heating pipes were dug into the ground, the wastewater pipes were replaced too.

“We also laid cable ducts and new phone lines between the buildings. We decided to do all the renovation in one go, to avoid digging up the yard more than once,” says Fazer. ▶▶



A herd of Highlander beef cattle graze on the manor’s meadows.



Karl Kankaala, steward of the manor and Karl Fazer, manor owner, together with Ari Sillanpää, KWH Pipe's representative.

Fazer considered connecting to the municipal sewer system instead of installing a domestic wastewater treatment plant, but the tender from KWH Pipe convinced him otherwise.

The manor uses about 12 m³ of water every day, including the water used for the garden, which has a separate supply line directly from the lake.

“The wastewater was previously fed through a system of chambers that were built in the 1920s and subsequently modified. The wastewater passed

through at least two chambers at every point.”

The new wastewater system will meet future needs too.

“In principle, we could make do with just one small wastewater treatment plant, but we wanted to allow for future growth. The pipes are also connected in such a way that if one plant develops a fault, we can switch to the other one,” Karl Fazer says.

QUICK INSTALLATION

After laying the outfall pipe and checking the drainage angles, the WehoPuts 80 was sited at the edge of a field, some 200 m from the manor buildings.

“The plant was very easy to install, it took less than a day. The foundation was the largest job. The excavation was carried out with a digger, and once the foundation was ready, all we had to do was to lift the tank into place,” explains Kari Kankaala, steward of the manor.

The WehoPuts 70 was sited near the lake shore, the storage facilities and the future heating plant. Both plants were anchored to concrete slabs. The installation was carried out by the manor’s own staff plus a plumber and a digger. ●

Keppo mansion, which stands near the town of Nykarleby, was built on hydropower. The nearby Keppo rapids were harnessed for energy as long ago as in the 18th century, when a sawmill was put up on the site.

Some buildings were lost to fire from time to time, but they were always persistently rebuilt. A particularly disastrous fire put an end to the sawmill operations in 1893. Subsequently, from 1900 onwards, the site housed a wool-spinning mill, which later turned into a weaving mill. In 1909, yet another fire halted industrial production.

Viktor Schauman bought the mansion in 1918. He renovated the buildings and farmland but was forced to sell the estate in 1930. An evangelical folk high school took over the main building, and during the war it was used for billeting soldiers.

Oy Keppo Ab acquired the mansion in 1954 and set up a large mink farm, which in the early 1960s was the largest of its kind in the world. Keppo was a household name on the international mink market; this too is part of the colourful history of KWH Group.

SOMETHING HAPPENING EVERY DAY

The mansion is situated on an island which is a place of outstanding natural beauty in the middle of the Lapuanjoki river. The area is also valuable in terms of cultural history. The main body of Keppo mansion dates back to the 1860s. In addition to the mansion itself, the verdant grounds contain a training facility, a museum, two residential buildings that have been rented out, a single-family house, and a cowshed that is currently disused.

The mansion, training facilities and museum are available for use by the Group’s employees and interest groups. Every year, many Finnish and international guests of KWH Group visit the KWH museum and the well-preserved late 19th-century milieu of the mansion.

“We can accommodate meetings for 20 to 40 people and provide catering for up to



The majority of the manor’s wastewater is treated in the WehoPuts 80 domestic wastewater treatment plant installed at the edge of a field.



Keppo mansion makes guests feel at home

The lovely Keppo mansion on Lapuanjoki river in western Finland, today the hospitality premises of KWH Group, had its wastewater system completely renovated in the autumn of 2006 with the installation of a WehoPuts 40 domestic wastewater treatment plant.

50 people. There is something happening almost every day,” explains Gösta Sandberg, who is in charge of the catering at Keppo mansion.

A significant portion of the food served is prepared with local raw materials. Fish and various game delicacies are popular with guests.

AHEAD OF THE TIMES

Keppo mansion is not connected to the municipal sewer network, and it had become known that an individual wastewater treatment system would have to be built by the end of 2013.

“We did not want to wait until then, of course, so we decided to take action in advance and set an example for others,” explains Nina Tyni, KWH Pipe Environmental Applications Regional Manager for western Finland.

The wastewater treatment system at the mansion was outdated, and the proximity of the river was another reason for fixing the entire treatment process in one go. In the old system, the overflow pipes from the precipitation chambers discharged straight into the river.

It was dubious whether the municipal wastewater system could be extended

across the river to the island. A WehoPuts 40 domestic wastewater treatment plant takes up very little space, and it was easy to find a place where to install it in the manor grounds. The old cesspits were made redundant, since the new system reduced the need to dump sludge to a minimum.

The WehoPuts 40 small wastewater treatment plant can process six cubic metres of wastewater every day.

“We also replaced the old wastewater pipes, putting plastic drains in place of the old concrete ones, since we wanted to make the new system as leak-proof and as simple as possible,” explains Tyni.

The Lapuanjoki Fund awarded a small grant towards funding the project, but not before a demonstration of the system had been held on site.

“We did not focus on the installation of the treatment plant in the demonstration, because there was nothing unusual about that, being a normal and uncomplicated earth moving process. What we did do was to present the entire project, from the initial planning stages right up to the inspection of the wastewater treatment process,” explains Nina Tyni.

The modern wastewater treatment system ensures that the idyllic splendour of the mansion will be preserved in all its freshness well into the future. ●

Professor Mieczysław Ostojki, head of the Helsinki Commission, emphasizes that the Baltic requires special protection because of its biodiversity. He sees the changes caused by the chemical products as the greatest single threat for the Baltic.

To be an ecologist, means you must help protect the sea

The Helsinki Commission, or HELCOM, carries out intergovernmental cooperation with the countries who border the Baltic Sea and with the European Union to protect the marine environment of the Baltic from all sources of pollution. This organization, headed by Professor Mieczysław Ostojki from Poland, therefore, brings together representatives from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

A JOINT EFFORT

The idea goes back to 1974 and the Helsinki Accords, which were intended to demonstrate a good spirit of cooperation between East and West during the Cold War and that both sides could work together. The environment was then quite a neutral topic and so it was the natural choice. The original treaty only referred to the international waters of the Baltic Sea but in 1992, a new treaty that included the entire catchment area was created.

“All countries must do something,” says Professor Ostojki. “Different countries pollute in different ways but every country can do something to improve the Baltic for the benefit of all!”

ACHIEVEMENTS

HELCOM has been successful in many ways. One of its greatest successes was

the banning of DDT as a pesticide. This chemical was used to fight the insects that cause potato blight but it causes significant damage once it enters the water cycle. Other major successes include giving ships the right to leave their waste at harbours without charge to stop the waste being dumped at sea.

“The Baltic needs special protection because of its biodiversity,” says Professor Ostojki. “The countries that border it are rich, and with wealth there is the danger of pollution.”

Over the past thirty plus years, HELCOM has gained a lot of experience and knowledge of what needs to be done. Nonetheless, it is not a supervisory body and all decisions must be taken unanimously.

The Baltic is almost entirely surrounded by the European Union; only Russia remains outside. “Russia participates as a country and is very open to joint discussions on what needs to be done to protect the sea. The country may not want to be seen to be implementing EU policy or to accept EU directives, but it accepts all of HELCOM’s recommendations nevertheless.”

THREATS TO THE SEA

Around sixty million people live in the catchment area of the Baltic. There are

the densely populated areas to the south of the sea to the almost uninhabited areas of Northern Scandinavia. The biggest threats to the Baltic are eutrophication, hazardous substances, navigational safety and biodiversity.

The greatest single threat is eutrophication i.e. the change in an ecosystem caused by the addition of chemical products, usually nitrogen or phosphorous. It causes certain plants to grow whilst killing others, which upsets the delicate balance of nature.

Over the past two hundred years, the Baltic Sea has suffered heavily from eutrophication. There is an alarming amount of blue algae in the Baltic and it has on occasions caused oxygen depletion and the death of certain creatures. This is particularly dangerous in areas where there is limited mixing of water.

Action has been taken for many years now to reduce pollution from sewage. In the EU all towns with over 2,000 inhabitants must have their own wastewater plant. However, treatment is only efficient if the wastewater does not escape, so efficient modern piping and other forms of technology are required. Ordinary people don’t see what they pump out into the environment; they only notice leaks when these leaks affect their normal, everyday life.



Agriculture is the biggest single cause of pollution. As a country, Poland is the biggest polluter, but it does have the largest population of the HELCOM countries and per capita it is one of the least polluting countries. However, Professor Ostojki repeats, "All of us need to do something. We need to balance the protection of the environment and the economy and be able to fulfil human needs and requirements."

WHAT CAN I DO?

We might accept that the environment needs to be protected but how can we do it? One option is to put pressure on both authorities and business to – pardon the pun – clean up their act.

Municipalities need to make sure that the technology they are using really is cleaning the wastewater and that dirty water can not escape and enter the water table. We can control the amount of detergent we use, and if our washing powder contains phosphorous then we can buy another brand that does not contain this chemical. We need to conserve water and think twice every time before washing something.

As far as agriculture is concerned, farmers should follow the rules regarding the best soil practices and avoid using fertiliser when it is raining, for example.

"If you are an ecologist, you must also help protect the sea," summarises Professor Ostojki. ●

LIVING WITH NATURE

Professor Ostojki reflects on how it all started for him. "I became interested in ecology when I read a UN report while still at school. The biology teacher asked someone to prepare a report and I volunteered. Then when I was in the Scouts we learned how to live with nature, not to leave waste in the forest, and respect for the environment was part of my general education."

Today he is the head of the meteorological and water institute in Warsaw, Poland. The objective of the institute is to protect the country from natural disasters and manage national security as far as weather and water are concerned. Poland is particularly prone to flooding. In 1997 there was a particularly severe flood which hit the Odra river and caused major damage to Wroclaw and Opole and other cities.

"With a flood there is only one thing you can do – to prevent it happening," he remarks. "Once it occurs it is too late. In the case of Wroclaw, where the water hit the town with a force of 1,000 cubic metres per second when the river could only take 500 cubic metres per second, nothing else could be done."

"We predict what might happen, we publish analyses on our website. Our three-day forecasts are practically 100% foolproof."

Professor Ostojki has been involved with HELCOM for many years. "I had just finished my Ph.D. and I was sent to a meeting to find out what Poland could do. From there I worked my way up in the organization to become deputy chairperson of a project implementation task force, and when it was Poland's turn to head the organization, my name was put forward by a minister who said that I had been involved for so long that it was only right that I lead the organization."

Professor Ostojki is very happy with the work he is doing and the progress that the organization is making.

"I find this job very rewarding. I have made many friends from many countries, and we all put the protection of the sea first before our national interests, and at the end of the day that is the only way that we can serve the national interests of all our countries." ●



PROJECT DETAILS

- **Project:** Broad Run Water Reclamation Facility
- **Owner:** Loudoun County Sanitation Authority
- **Application:** OA Yard Piping – Approx. 6,200' 18"–60" Weholite Multiple Reducers, Tees & Elbows
- **Consultant:** CH2M Hill, Herndon, VA
- **Contractor:** Fru-Con Construction & Pizzagalli Construction

Odorous air yard piping

The State of Virginia is located on the eastern seaboard of the United States not far from the beautiful Chesapeake Bay region.

Back in 1975, the Loudoun County Sanitation Authority (LCSA) in Ashburn, Virginia recognized the need for an advanced wastewater treatment facility to handle the projected growth in the area. The 10 mgd Broad Run Water Reclamation Facility is surrounded by 128 acres of forest and wetlands, so an environmental and community-friendly solution was needed. The cleaned water will be returned to Broad Run, which joins the Potomac River downstream. Construction began in July 2004 and is currently on schedule for completion in early 2008. LCSA has made significant investments in architecture, state-of-the-art odour control and landscaping in the region so it will be a positive asset to the local community. Construction is scheduled for completion in early 2008.

The piping for this project required many different pipe materials. The Odorous Air (OA) yard piping 18" and larger, was specified as Profile Wall ASTM F894 PE-HD. Fru-Con Construction recommended Weholite to the engineers. With many directional changes and an extensive pipe network, Tim Smith, Project Engineer Manager for Fru-Con said, "Weholite offered greater flexibility and ease of assembly than the competitor brand. With Weholite, field modifications were made easy due to the extrusion-welded joint process. We were not restricted by the set lengths of bell and spigot pipe." Extrusion-welded joints ensure that there is no release of foul air allowing the plant to operate in an environmentally friendly manner for years to come. The Weholite system also pre-



vents inflow and infiltration through off-set joints, structural cracks and pipe corrosion commonly associated with foul air and sanitary systems, thus allowing the plant to run more cost-effectively in the future.

Weholite has provided LCSA with a long-lasting PE-HD pipe system that is corrosion-resistant, completely leak-free and environmentally friendly for the surrounding community. This is one of many projects in the Chesapeake Bay and surrounding watershed region currently being proposed over a 10-year period, prompted by the Clean Water Act which is enforced by the US Environmental Protection Agency (EPA). Successful projects such as this one give credibility to future orders that are vital for this type of environmentally protected and sensitive region. ●

The City of Windsor and its surrounding area, with a population of over 300,000, is located in the southwestern portion of the province of Ontario, Canada. It is situated on the Detroit River and borders the United States of America.

Weholite yard piping

under Lou Romano WRP

The community, together with various industrial, businesses, government, academics and environmental organizations works collectively towards looking at ways to help to improve the health of the Detroit River. The nearby Lou Romano Water Reclamation Plant serves the local area and combines 30 hectares and a plant capacity of 273,000 m³/d.

In early 2003, the residents of Windsor learned that they would soon see improvements to the Lou Romano Water Reclamation Plant. The existing plant would be upgraded to improve the water quality that flows from the plant to the Detroit River.

The project would include the construction of a full biological secondary treatment facility to enhance the plant's treatment capacity and expand the service area to support continued growth to the City of Windsor and the nearby Town of LaSalle.

Traditional pressure pipe was initially specified and costed. During the design phase of the project (the largest capital work project to date by the city), the City of Windsor asked Stantec, the prime design consultant, to evaluate suitable alternative pipe materials.

KWH Pipe stepped in and presented Weholite, and after a detailed analysis,

Weholite was chosen for the first phase for its project savings and for meeting the requirements of the project.

Weholite is a closed structured-wall high-density polyethylene pipe made to ASTM F894. The pipe is immune to H₂S attack and is not affected by the chemicals commonly found in domestic and industrial wastewater. Also, past independent testing has shown that polyethylene pipes are more abrasion resistant than other conventional sewer pipes.

The Weholite pipeline with its smooth inner surface and extrusion-welded joints means the owner will have a leak-free piping system with excellent hydraulic characteristics for its entire service life. This project used approx. 700' of 96" RSC160/250 Weholite and an additional 200'+ of 48"/36" RSC160 Weholite with a maximum service pressure of 8 psi.

After the first phase was successfully completed, Weholite was specified and chosen for the additional two phases of underground pipe works.

The contractors, although not previously familiar with Weholite, were so satisfied with the pipe product that they have indicated that they propose to use it in future projects. In fact, KWH Pipe has received an order for Weholite for a project at a Toyota facility in Woodstock, Ontario. ●



PROJECT DETAILS

- **Project:** Lou Romano Water Reclamation Plant Capacity Expansion & Upgrade
- **Owner:** City of Windsor, Ontario, Canada
- **Application:** Yard piping – Approx. 900' of 96"/48"/36" RSC250/160 Weholite
- **Distributor:** Terrafix Geosynthetics Inc.
- **Consultant:** Stantec Consulting
- **Sub-contractor:** Spurr Contracting Inc.

In 2004, KWH Pipe supplied several kilometres of large-diameter polyethylene drinking-water pipework for the new water treatment works which supplies 700,000 people in the city of Glasgow, Scotland. Only one piece in the puzzle still remained to be solved.

Katrine water project

Scottish Water's main contractor, M.J. Gleeson (now part of the Black & Veatch Group), had to decide how to install the main large-diameter supply pipework between the treatment works and the huge storage tank at Bankell, in an area of outstanding natural beauty, which is in constant use by members of the public.

KWH Pipe, in conjunction with the engineers from Gleeson's, hit upon the novel idea of laying the water supply pipes (2 x twin lines) across the bed of the Mugdock reservoir – something that had never before been tried with large-diameter pipes in the UK.

After months of design and planning work, the operation finally took place in late summer 2006.

Gleeson and their welding contractor (A.G. Wilson), set up a pre-fabrication area at the northern edge of the reservoir to butt-fusion weld the pipe into long strings, and at the same time to attach large concrete weights to the pipe before the welded



pipe with the weights attached, was floated out onto the reservoir prior to submersion.

The 2 x twin lines were then towed into their separate positions to await submersion.

With the assistance of KWH Pipe's engineers, Gleeson's own pipeline engineers began sinking the first twin pipeline over a slightly shorter crossing. This was successfully completed in one afternoon.

The sinking of the longer twin pipeline, commenced the next morning and the operation was completed later the same day.

During submersion, divers were used to ensure that the pipes settled evenly on the bed of the reservoir, which, although it had been surveyed, had not actually been seen since it was constructed over 150 years

ago. Rumours of the remains of several old houses on the bed of the reservoir were, happily, unfounded.

This innovative idea, thought up by KWH Pipe and Gleeson, saved disruption to a particularly beautiful area of the Scottish countryside and offered an economical and practical solution to an otherwise extremely difficult pipeline installation through the causeway of the reservoir.

M.J. Gleeson (now Black & Veatch), is probably the only company with experience of installing large-diameter polyethylene pipework in the whole of the UK and there is now evidence to show that the partnering arrangement with KWH Pipe, now going back over a period of several years, can provide practical and cost-effective solutions to a range of pipework installations. ●

A few years ago, a leak problem emerged in the plastic pipes owned by Vodokanal, the St. Petersburg firm that is the equivalent of a municipal water board. Closer inspection of the leaks revealed that they were caused by breaks in the butt welds where the polyethylene pipes are joined together.

Vodokanal first suspected that the pipes were faulty, but more careful inspection revealed that the problem stemmed from the welding methods used.

“We offered to help Vodokanal resolve the problem with training, as we have the necessary welding expertise,” says Tapio Alanen, marketing manager at KWH Pipe Technology.

The first butt-welding course arranged by KWH was held in late 2006, and three of the three-day courses have been held for Vodokanal welders so far, with 15 people taking part in each.

STRICT THEORY AND PRACTICAL WELDING EXERCISES

The principal instructor on the welding course was Hannu Heikka from the Hyvinkää-Riihimäki Vocational Adult Education Centre, who has been training welders for over 20 years. Heikka has three assistant instructors and an interpreter to help him.

“The syllabus first covers the theory side, which deals with the study of materials, properties of plastic, pipe manufacturing technology, dimensions and markings, and the standards used in different countries. We also go through butt-welding techniques and delve into welding equipment and maintenance, and welding-pressure tables,” explains Heikka.

The second day of the course is used for various pipe-welding exercises followed by instruction in the use of welding tables and welding-equipment reporting units. In the evening, there is a strict theory exam to see whether the students have taken in the subjects studied on the first day. According to Heikka, the students have to take the theory side seriously in order to pass the exam.

KWH Pipe organizes welding courses in St. Petersburg, Russia

Training for Vodokanal welders

KWH Pipe Technology is training welders at the St. Petersburg water company in butt-welding, to teach them how to weld to European standards. Besides a demanding theory section, the course syllabus includes practical welding exercises.

“On the third day, there is an opportunity for the students to show what they can do. Each of the participants welds their own section of the sample pipe to produce a long pipe full of butt welds. The climax of the course is the tense moment when a pressure test is carried out on the pipe and the water pressure in the pipe is built up until it bursts. The students brace themselves to see where the pipe eventually fails – at one of their welds or at some point in the pipe itself. So far, the joints have not failed once,” says Heikka with satisfaction.

Each of the students is given a personal certificate with a number which they write beside every welded joint they make at work from that moment on. This means that all welding work is traceable.

CLEANLINESS IS VITAL

“The most important thing the students learn is that cleanliness is vital. Problems can be caused if the ends of the pipes are dirty or greasy. I also emphasize that good equipment on its own is not enough; whether or not you get a good result depends on the skill of the welder,” Alanen points out. •



Stockholm connects its district heating networks underwater

Fortum Värme AB has been focusing on improving the efficiency of its operations and on its customer service. As part of this, its separate district heating networks in Stockholm are currently being connected. This is being done with underwater pipes that KWH Thermopipe has produced especially for Fortum Värme.



Fortum supplies customers in Stockholm, Sweden with district heating, district cooling and town gas.

“Approximately 75% of the city is covered by our district heating network,” explains Niklas Eriksson, purchasing manager for district heating services at Fortum Group.

“Fortum aims to be the natural choice of energy provider in its areas of operation, the preferred option for customers. This is why we are constantly developing our operations and making them more efficient. The decision to link up our four district heating networks in Stockholm is part of this,” explains Eriksson.

Eriksson is project manager of the City-Söder building project, in which the district heating networks in the centre of Stockholm and the city’s southern districts will be connected. These two networks account for 6.7 TWh of Stockholm’s entire network capacity of 8.6 TWh.

The background to this project is the desire to improve customer service and environmental protection while boosting the efficiency of operations.

“During the summer, we will be able to concentrate our output by running some of our plants at full capacity rather than running all of them at reduced capacity. During the winter, we will be able to minimize the use of the least environmentally friendly form of energy, i.e. energy produced using oil to meet peak consumption, as we will now be able to transfer energy to where it is needed better than before. One large network is also much more beneficial for customers if there are malfunctions,” explains Eriksson.

PIPES MADE TO BE SUNK

According to Niklas Eriksson, Fortum Värme first considered extending its district cooling system in conjunction with the

connecting of the networks but the final decision was to carry out the two tasks separately, and the work on the district cooling system was completed a few years ago.

“There is a very high demand for district heating,” explains Eriksson.

The initial plan was to connect the district heating networks using an above-ground solution, with the new pipeline running along islands and underneath bridges and through the new railway tunnel that is being planned for the centre of Stockholm. However, the railway tunnel option would have meant delaying the work for at least ten years, according to the latest information, and it would have been difficult to landscape the pipes in the above-ground option.

“The total pipeline structure is approximately 1 metre high and 3 metres wide, after all.”

The planning was eventually based on one of the options presented by the project



STOCKHOLM DELIVERY

KWH Thermopipe delivery comprised:

- Pipes DN800/DN1000, 2,200 m
- Bends DN800/DN100, 22 pcs
- Materials for joints

planners, FVB District Energy: laying the new pipes underneath the Riddarfjärden bay. Fortum Värme put out an invitation to tender regarding suggestions for how to construct the pipeline and for information about previous similar projects.

“This is an unusual technical design and totally different from anything we have ever done before. That is why our choice of partner was governed by their design concept, their experience and their reliability. There was a lot of interest in the project, but we eventually chose KWH

Thermopipe to supply the pipes, as they have installed a lot of underwater pipes.”

KWH Thermopipe delivered the 1 km of DN 800/1000 pipeline in 16-metre sections, which significantly reduced the number of joints compared to the other options. The pipe elements are pre-stressed and have a casing made from PE-coated steel pipe. The quality of steel used in the pipes and bends has been customized to the requirements of Fortum Värme.

KWH Thermopipe has constructed a special foaming table, which is well suited for the manufacture of pre-stressed pipe elements for this and future projects. This pre-stressed pipe construction makes installation easier and reduces heat losses. Sture Andersson, one of Sweden’s leading experts in material strength, provided support for the project.

“It was important for Fortum that the entire team worked well and supported one

another. The expertise of KWH Thermopipe has been a great asset during the various stages of the project,” explains Niklas Eriksson.

DEMANDING CONDITIONS DURING INSTALLATION

A total of 2.2 km of new pre-insulated underwater pipes will be laid during the project. At the same time, a DN 900 drinking water main will be supplied and installed for Stockholms Vatten AB. The pipes will be welded and joined together on land. The work is divided into three stages measuring 200, 300 and 500 metres. The pipes will be pulled into place in stages, and the final joints will be made on location where the pipe will be submerged.

“The installation is demanding on many levels. We are in the middle of the city, there are a lot of boats and ships, the currents are quite strong, and there are also unusual conditions on the sea bed. An assessment of the sea bed was also needed in order to remove or avoid rocks and other objects on the sea bed that might damage the pipe, and we also needed to find and avoid ship wrecks. Safety has been the most important factor regarding the work itself, other people on the water, and the environment. We have been closely monitored by environmental officials and the people of Stockholm.”

The installation timetable was one of the important factors when choosing the pipe supplier. Installation had to be completed well in advance of the water freezing over.

“We have a long history of cooperation with KWH and have been satisfied with the way they keep to timetable, with their advice and support and with their prices – all the fundamental issues, in fact. That is why KWH Thermopipe supplies a significant percentage of the pipes we need every year.” ●

Some time ago, Tero Niemi made a decision to renew the wastewater treatment system for his 1970s outdoor sauna. Built in the old style, the system consisted of a drain leading from the sauna floor to a soakaway – a pit filled with stones, which was not draining the water particularly well anymore. The incoming water supply was pressurized. In addition to warm water produced by the hot water storage tank, washing water could be heated in the tank of the sauna oven.

“When you had a bigger group in the sauna, you were always worried the wastewater would end up back on their toes,” says Niemi with a laugh.

During the winter, the Niemi family rarely uses the outdoor sauna: mainly for an atmospheric Christmas or New Year sauna. During the summer, the sauna is heated a couple of times a month.

“The indoor sauna in the house is electrically heated, or as we call it: a grill,” explains Niemi.

Initially the installation of the new system was to take place in the autumn, but other things came up in between. The timing of the installation was also affected by the fact that the Niemis were doing other basic repairs that were breaking up the ground, and the damage caused by those

repairs and the installation of the tank could be fixed later at the same time.

KWH Pipe’s WehoSeptic subsurface plants have been designed for wastewater treatment of single-family houses and holiday homes. Such plants make use of the characteristics of natural soil or utilize the soil’s ingredients to purify wastewater through infiltration.

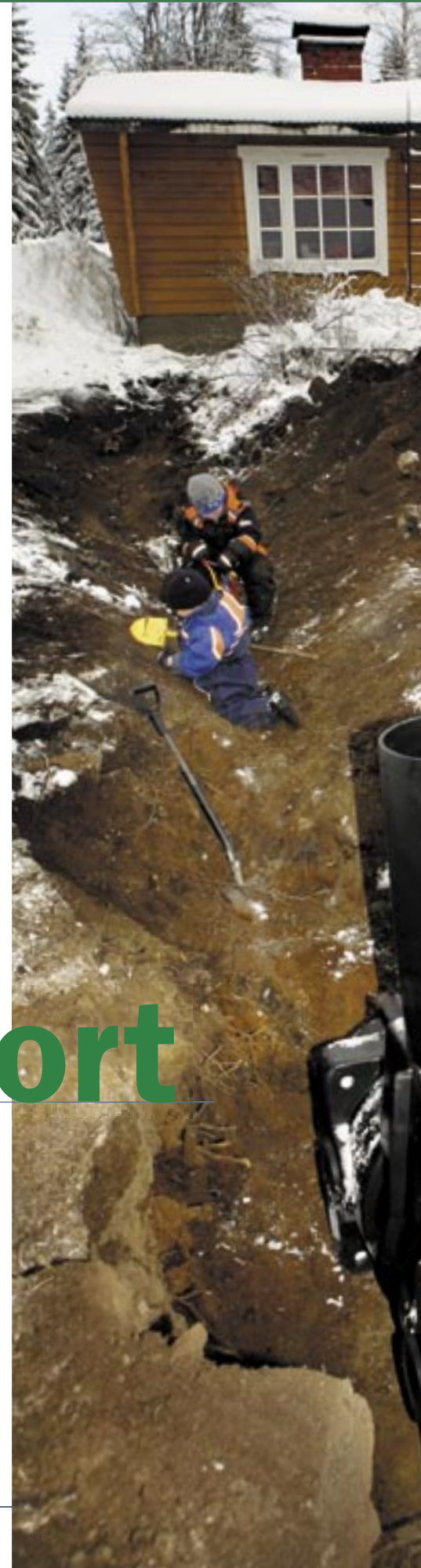
INSTALLATION CAN BE DONE BY ONE MAN

As the residents of the house had a sound knowledge of the terrain, it was easy to pick a place for the tank. The layers of ground had become familiar to the Niemis while building a residence for their parents at the turn of the millennium. The main building dates from the 1950s.

The WehoSeptic job for the Niemi sauna was done by five men. In addition to the driver of the excavator, Tero Niemi, his father and his two sons took part in installing the 500-litre tank.

“The 3 and 5-year-olds were helping with their little excavators,” says Niemi with a smile and adds that the basic installation could be done by one excavator driver.

“Although that would require the driver to jump in and out of the excavator a bit,



Sauna comfort

through subsurface
wastewater treatment

The Niemi family from Jämsä, Finland, modernized the wastewater treatment in their wood-fired outdoor sauna in one go. The subsurface treatment system, installed on a Saturday in February, easily handles water used by several people – from the test run on the instalment day.



PLANNING AND DIMENSIONING SUBSURFACE WASTEWATER PLANTS

A subsurface wastewater treatment plant is well suited to treating wastewater from single-family houses that are not situated close to lake shores or groundwater aquifers. In such instances, options may include soil absorption or soil filtration. Absorption is suitable for permeable ground, filtration for non-permeable ground.

Subsurface wastewater treatment plants consist of a precipitation tank, a distribution chamber, and infiltration and collection pipes. A functional and effective soil filtration system that meets modern requirements often requires separate, enhanced phosphorous removal.

Properties located on a shoreline often require a separate drainage system, in which washing and household wastewater, 'greywater', is treated in a subsurface plant, and WC wastewater goes into a closed septic tank, or else a dry toilet is used.

so it's good to have at least one man with a shovel around."

Residents often watch the installation, even if they do not participate in the actual process.

"It is not a bad time to refresh one's memory over how the system operates and to clarify its underlying principles."

In this instance, a spirit level was sufficient to handle the falls for the plant, as the location was simple enough. System installations for residential buildings require an optical level.

A sauna wastewater treatment plant requires only one distribution pipe. Washing water is absorbed by the soil, other solid matter stays in the tank. It was agreed during installation that the tank will be emptied by a vacuum tanker. The tank was not dug into the ground, but into an existing embankment. Underneath the infiltration pipe, a layer of sand and gravel was laid for purification of the wastewater. Niemi estimates that the tank should be emptied once a

year, even though it may not be completely filled with solid matter in a year.

DOCUMENTATION ON CAMERA

A camera has become an important tool on installation sites.

"Documenting the work is always useful. I always take digital photos of my sites and archive them. This way, the core information from the site can be easily maintained, and years later you don't have to wonder how the plant was installed. The camera can be the camera on your mobile phone, their quality is usually good enough," advises Niemi.

The Niemi sauna was tested in practice immediately after installation. The five-person test group was happy with the system.

"We used the shower a lot, and we ran a couple of bath tubs full of water, too. Everything works. The first section of the tank was only half full," commented Niemi after the inspection round. ●

Environmental and financial concerns are increasing the demand for new solutions to protect pipes and joints from corrosion. A new technology for applying plastic coating could be the answer.

Giant oil and gas pipeline networks are being built in increasing numbers all around the world, and owners and operators are continually emphasizing the increasing importance of dependability.

Until there are alternative sources of energy available, it is crucial to make sure that the environment is protected from oil spills due to broken pipelines. KWH Pipe Technology, which sells plastic-coating systems for steel pipes, is having a stab at this market.

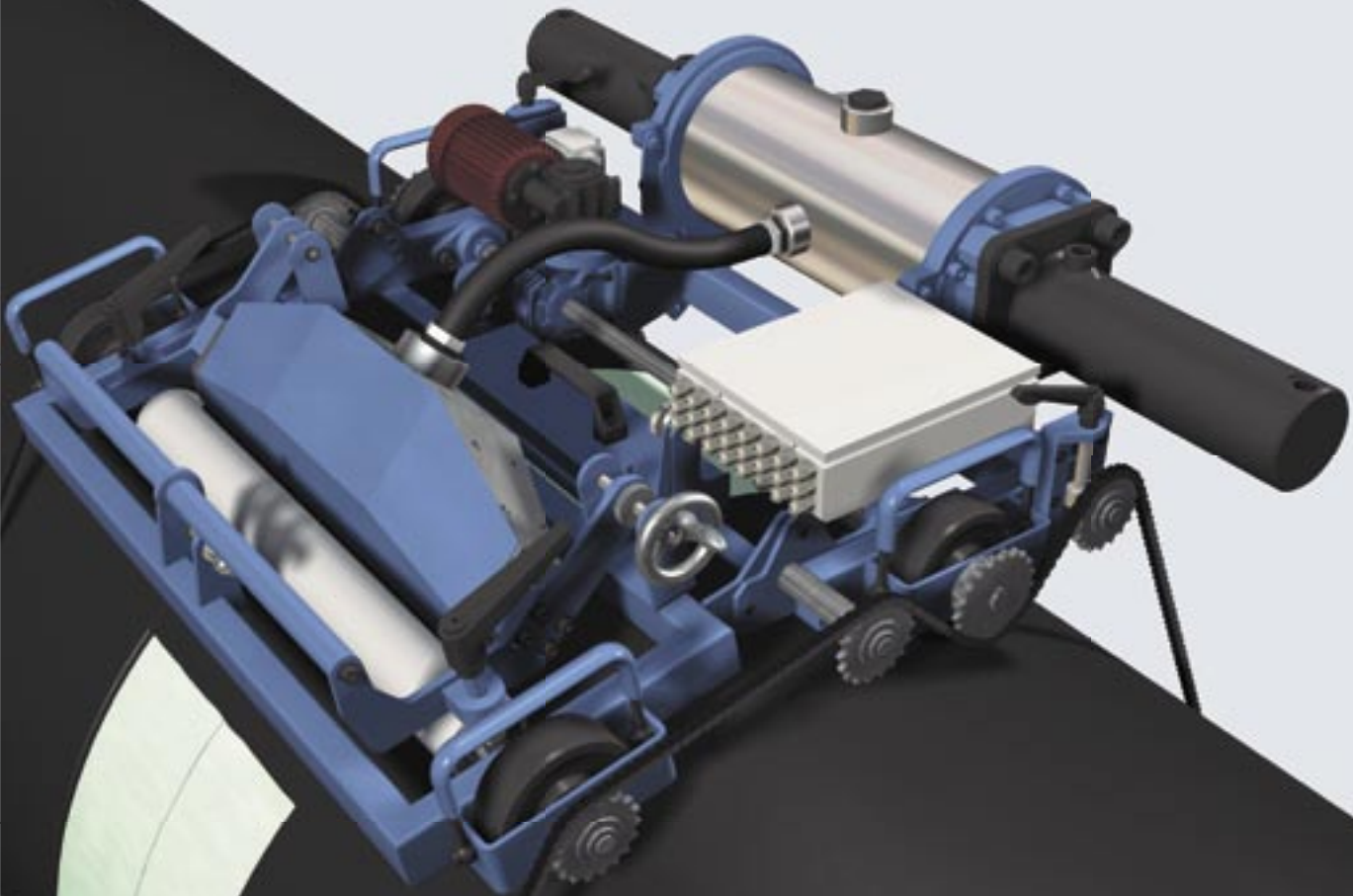
In conjunction with one of its plastic raw-material suppliers, the Borealis Group, the company has developed a new type of molten-plastic coating technique for jointing factory-coated steel pipes, which works well

even in extreme conditions in the field.

There is a robust market for oil and gas pipes in Russia, where KWH is hoping to sell the new equipment. But the coating of steel pipes with polyethylene was started at the Technology department partly because of the jungle conditions where Kari Ahven, now sales manager of KWH Pipe Technology, used to work. Kari has built pumping stations for several major oil pipelines.

“In Ecuador, for example, hundreds of kilometres of pipe were laid from the Amazon jungle over the Andes to the Pacific coast. This project demonstrated graphically that in the future, oil was going to be pumped from more and more difficult places and it was

Jointing device invented in the field



going to demand more and more from the materials used,” muses Ahven.

CLOSE TO THE CUSTOMERS

In the next couple of decades or so, around five hundred major oil and gas pipeline projects will be on the drawing board. In twenty years, some 220,000 kilometres of pipeline will be built, so there will be plenty of installation work going on.

Broken pipes cause a lot of emergencies and considerable financial loss, not to mention environmental disasters. Welded joints made in the field, together with their insulation, are the most common starting points for leaks. Joints are particularly challenging when you have to think about giving them a protective coating in the field.

According to Kari Punnonen, head of the Vaasa unit of KWH Pipe Technology, pipeline owners and operators are looking for quality and reliability, and are ready to pay. Using current materials the pipes will last for at least 50 years, often more.

Kari is keeping an eye on projects being planned close to Finland. The Nord Stream gas pipeline, for example, is planned to run for a distance of 1,200 kilometres across the bottom of the Gulf of Finland and the Baltic Sea, all the way from Vyborg in Russia to Greifswald in Germany.

Traditionally, steel pipe is used for major oil and gas pipes, but for a long time now the durability of the pipe has been increased by coating it with plastic. KWH is testing the market by offering customers a coating line for steel pipe used for oil and gas pipelines, which coats the pipe in polyethylene or polypropylene.

“We can provide a coated-pipe production line that handles the process from start to finish, on the turnkey principle,” explains Kari Punnonen.

KWH can supply production lines for steel pipes of 90 to 1,500 mm.

PIONEERING JOINTING MACHINE

The idea behind developing the equipment for coating pipes was to increase the re-

liability and durability of the coating at the joints. A working group was set up for the development, which met for the first time in March 2006.

The group included professionals from KWH Pipe Technology, its subsidiary Extron Engineering and the Borealis Group, the world's leading supplier of plastic raw material for coating pipes. The company's market share is 80% in Russia and 50–60% globally.

Bringing together a top team generated a rapidly developed project for a new type of jointing device (Field Joint Coating). The device can be used to make joints in the field, which, in terms of the construction, simulate the 3-layer plastic coating on the pipe. The outer layers of the joint are machined using the SAPO product, specially developed by Borealis for coating field joints. A separate plastic adhesion layer is not required. The jointing can also be carried out perfectly well in tricky conditions in the field.

“Coating a reliable joint made like that is more economical in terms of materials than shrink plastic, for example, which is normally used at present. The coating provides excellent protection against corrosion,” emphasizes Kari Ahven. Development engineer Leif Leiden, from the innovation and development department at Borealis, is very pleased with the results of the collaboration, as pipe-jointing techniques cannot normally be used in the field.

“The technology we have developed is completely new and far better than anything that preceded it. We have been working together as a dream team, and the design of the equipment has progressed amazingly quickly,” says Leiden with a glow of satisfaction. The prototype was finished just twelve months after the working group met for the first time – top speed for a ground-breaking innovation. A patent for the machine has been applied for during the spring of 2007 and it will be demonstrated in the near future to customers at tending customer seminars. ●



Epoxy powder, adhesion plastic and an outer layer of polyethylene are combined to provide the pipe with an excellent protection against corrosion.

Excellent protection

The plastic-coating lines for steel pipes offered by KWH Pipe Technology work up dirty steel pipe into plastic-coated pipe from start to finish.

The pipes are often stored outdoors, so they rust and get dirty. The steel pipes are preheated to 80°C in a gas or induction oven to dry them for cleaning.

After cleaning, the pipe is given a primer coat of electrostatically sprayed epoxy powder. Next, the pipe is given a thin film of adhesion plastic which ensures that the 3-mm outer layer of polyethylene and epoxy stick together. Both the adhesion plastic and the polyethylene are laid on with an extruder.

In the end, the three-layer coating acts as one single layer, providing the steel pipe with excellent corrosion protection. Because of the construction, the pipe is easy to install without a bedding of sand, which is difficult to transport to the site. Installation is perfectly successful using a larger grain aggregate. ●

Reliable and durable **Weho tanks**



A lower-level water retention tank. The inside measurement of the Weho tank is 2,400 mm, it is 25 m long and has a volume of 100 m³. The internal diameter is 2,200 mm and the pumping chamber is attached to the end of the tank.

Weho tanks as complete deliveries

Examples of solutions:

- Lower-level retention tanks
- Alkalization tanks
- Chemical tanks
- Septic tanks
- Balancing tanks
- Overflow tanks
- Flood water basins

WehoPuts domestic wastewater treatment plants

- Wide range of products: treatment plants for single households and small villages
- Excellent treatment results
- Need little maintenance