THE KWH PIPE CUSTOMER JOURNAL » ISSUE 12 » WWW.KWHPIPE.COM

pipe world

A lower-level water retention tank. The Weho tank is 25 metres long and has a volume of 100 m³. The pumping chamber is attached to the end of the tank.

Reliable and durable Weho tanks

Weho tanks as complete deliveries

- Lower-level retention tanks
- Alkalization tanks
- Chemical tanks
- Septic tanks
- Buffer tanks
- Overflow tanks
- Flood water basins
- Sludge collector tanks

WehoPuts domestic wastewater treatment plants

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

KWH PIPE

www.kwhpipe.com

NO TIME LIKE THE PRESENT

Pipes lay at the foundation of a functioning society, and are often an integral part of construction and development projects, from housing and infrastructure to mining and the construction of power plants. Our society and its well-being depends on the pipelines under our feet to bring clean water to our taps, transport wastewater to treatment plants, provide us with heating or gas and lead away stormwater. Pipelines are often "out of sight, out of mind", but if they fail, the result can be disastrous, in both monetary and safety terms.

There is no better time than now to invest in pipe networks; old concrete, clay and metal pipes are starting to feel the strain of time, and this is leading to an increasing leakage of potable water, wastewater, and even chemicals. Investments in long-term sustainable solutions can effectively improve the quality of living and at the same time save costs in the long run.

Increasing environmental awareness and the scarcity of water has made governments and utilities more inclined to act before it is too late. EU funding is allowing many Central and Eastern European countries to upgrade their water delivery networks. At the same time, private companies are seeking cost-effective and sustainable solutions for construction and development projects.

In these challenging times it is even more essential to make the right decisions. In a large project it therefore becomes crucial to weigh up the total lifecycle cost of a pipe installation. Plastic pipes are an attractive alternative as they are economical to install, operate and maintain, and have a long service life. But piping in itself is not enough, since all projects are individual and require individual solutions. Through our local presence and international reach, we are able to be where our customers are and provide expert solutions for challenging projects. Successful completion of a project starts with good planning and design. By taking all elements into consideration from the beginning, unnecessary risks and time-consuming challenges can be avoided and projects can be executed cost-efficiently.

In this edition we invite you to read more about our piping solutions and the projects we have been involved in, including our unique mobile plant concept of bringing the pipe production to the customer.

Jan-Erik Nordmyr
President & CEO, KWH Pipe Ltd

issue 12

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PE PP PVC

Weholite pipes at the 65th anniversary of the Warsaw Uprising

With the 65th anniversary of the Warsaw Uprising in Poland, the Lower Silesian Historic Initiative organized an open-air exposition entitled "The Warsaw insurgents – now in Wroclaw", dedicated to the history of the Uprising and the original insurgents currently residing in Wroclaw and Lower Silesia.

The exposition was built using two 12.5 m Weholite DN/ID 2,000 mm pipes. Historical images and articles relating to the 1944 Warsaw Uprising were fastened to 22 posterboards outside and inside the pipes. A further 14 stands, each devoted to the history of an individual insurgent, were also erected around the pipes.

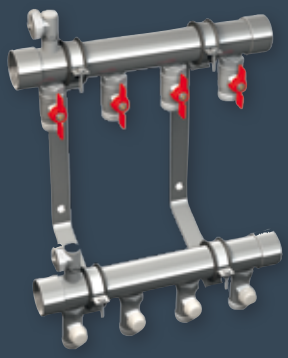
The organizer, Ms. **Dominika Arendt-Wittchen**, claims that Weholite was the only pipe on the Polish market that suited the exposition and met all the requirements.

The main idea of the pipe concept was to represent the sewage pipes through which the soldiers and civilians had to wade during the Uprising. Large-diameter pipes, which were durable and easy to install, were therefore needed. They also needed to be as light-weight as possible, as the exposition was to be erected on the historical Old Town pavement. The favorable price and recyclability of the material were also decisive factors. Considering the numerous advantages of Weholite pipes, it is not surprising that the organizer was pleased with the use of them in the project.

The ceremonial opening of the exposition was held on 1 August 2009 at 5 pm (the very hour at which the Uprising started). It remained on display at the Wroclaw market until the 18th of September, after which the exposition then began a tour of other cities around Poland, including Zawiercie and Zabrze. ■

WEHOMELT – KEEPING THE WINTER OFF THE STREETS

KWH Pipe's WehoMelt underground heating system is a specially designed pipe system for the thawing and heating of roads, pavements and other paved areas, and non-paved outdoor areas such as sports fields. The system also serves as an effective underfloor central heating system for large industrial halls. The popularity of underground heating, particularly of pedestrian walkways and shopping centres, is on the rise due to the ease and reduced cost of de-icing and maintenance that the technology brings.



The WehoMelt system uses 25 x 2.3 mm PEX pipe for maximum flow and thawing capacity to cope with even the most demanding winter conditions. PEX pipe is ideal for underground heating applications due to the material's outstanding pressure and thermal resistance properties.

PEX is also renowned for its flexibility and ease of use on site during installation.

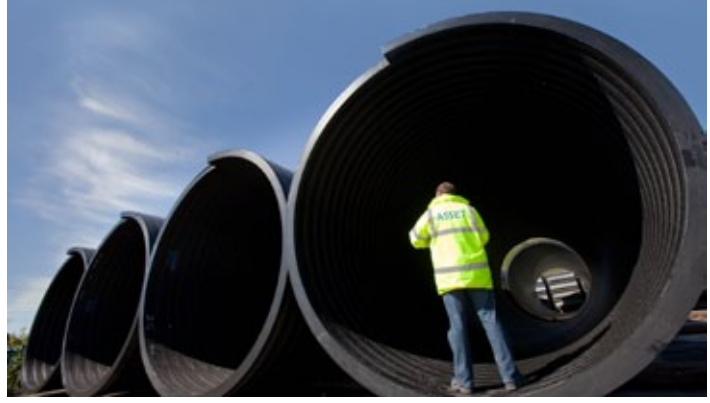
1 1/2" stainless steel manifolds or, for larger areas, ground-embedded plastic PE manifolds are also available for the WehoMelt system. The steel manifolds come ready assembled at the factory complete with heating circuit-specific shutoffs.

The stainless steel manifolds also enable circuit-specific adjustment of the flow rate to the manifolds, which facilitates the design and operation of the heating system. ■

With Weholite, the sky is the limit

KWH Pipe's Weholite licensee in the UK, Asset International Ltd, has opened a new production line at its factory in South Wales, which enables the production of 3.5 metre internal diameter Weholite pipes. With the new production line the company can double its output capacity and incorporate the latest in highly engineered pipe extrusion technology.

The new pipe provides large-scale solutions for customers looking for easy-to-install, flexible pipes that mirror the strength of traditional materials. The new 3.5 metre diameter pipe will also offer further opportunities for the use of the pipes including in prefabricated SUDS (Sustainable Urban Drainage Systems) solutions in-line with the Government's future water strategy for flood alleviation in England and Wales. ■



APPOINTMENTS

KWH Pipe Finland

Ms **Sanna Mäki-Jouppila** has been appointed Inhouse Sales Export Assistant as of 28th of September 2009.

KWH Pipe Technology

Mr Sebastian Skuthälla has been appointed Project Engineer at KWH Pipe Technology, Project Services as of 10th February 2009.

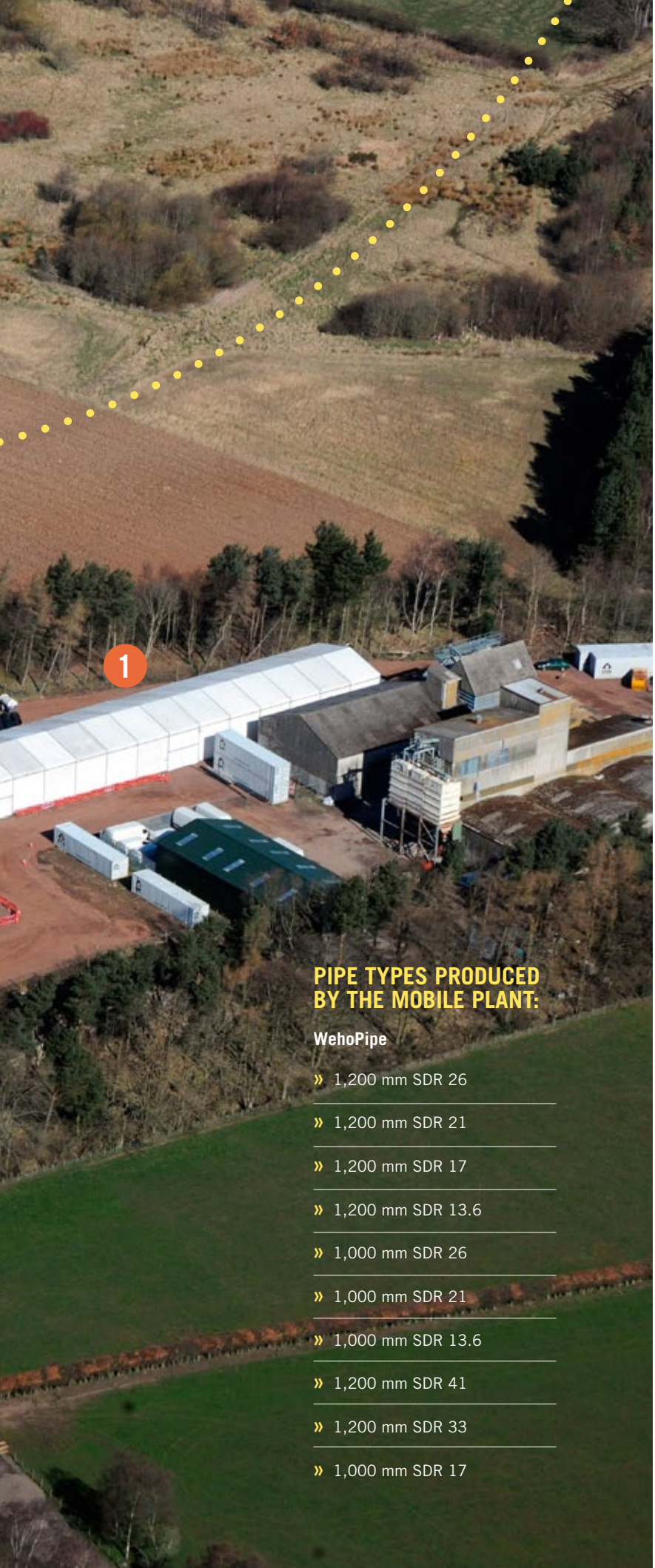
Close cooperation with mobile production

TEXT Tina Hellman » PHOTOS KWH Pipe and Scottish Water »

Scottish Water teamed up with engineering, consulting and construction company Black & Veatch and KWH Pipe to employ a unique solution by setting up a mobile pipe production plant. The project is reducing costs and environmental impact when Edinburgh's water treatment facilities are renewed.

OVERVIEW OF THE WORK SITE

1. Pipe extrusion
2. Buffer stock
3. Pipe storage area
- Pipeline route



PIPE TYPES PRODUCED BY THE MOBILE PLANT:

WehoPipe

- 1,200 mm SDR 26
- 1,200 mm SDR 21
- 1,200 mm SDR 17
- 1,200 mm SDR 13.6
- 1,000 mm SDR 26
- 1,000 mm SDR 21
- 1,000 mm SDR 13.6
- 1,200 mm SDR 41
- 1,200 mm SDR 33
- 1,000 mm SDR 17

At Glencorse, Scotland, Scottish Water is currently carrying out a major project to build the new Glencorse Water Treatment Works (WTW) and replace ageing mains and storage tanks providing water to Edinburgh and surrounding areas. Included in the project is the laying of over 15 km of large diameter polyethylene pipe for pipelines that will carry treated water from Glencorse to the existing water supply network in Edinburgh. For this project, KWH Pipe set up a mobile pipe production plant at Seafield Mill on the outskirts of Edinburgh.

The aim of the project, which is planned for completion in September 2011, is to facilitate the area's continued expansion and improve the quality of drinking water to around 450,000 customers throughout Edinburgh and the Midlothian region. Once completed the Glencorse WTW will blend quietly into the Midlothian countryside with minimal disruption to the surrounding area. It will be almost impossible to see the competed treatment works, as the largest "green roof" in Scotland will camouflage the works against the hillside.

Yet around 175 million litres of water will pass through the pipeline every day. **Richard Anderson**, Scottish Water's Senior Project Manager explains: "This pipeline further enhances the environmental credentials of the project, which will not only sensitively blend the treatment building into the surrounding countryside with the largest green roof in Scotland, but also reduces energy use by incorporating efficient modern hydro-turbines to generate on-site power. In addition, the location of the water treatment works and the route of the pipeline will help to reduce energy need by removing the necessity for energy-sapping pumps."

He confirms that he is very pleased with the different aspects of the project: "It will reduce energy use, maximize the very latest technology and deliver clearer, fresher drinking water for customers throughout Edinburgh and parts of Midlothian for many years to come."

Successful cooperation

Scottish Water chose to work with Black & Veatch and KWH Pipe on the Glencorse Project. Black & Veatch could offer the best mix of quality and cost, and KWH Pipe could provide innovation and expertise with respect to the pipeline.

Gus Conejo-Watt, Capital Investment Delivery Manager at Scottish Water, was happy with the outcome, as the Edinburgh project has the same team that successfully managed the Katrine Project in Glasgow a few years back (*see Pipe World 1/2007 and 2/2004*). The Katrine Project showed the true innovation the three parties were able to create together. The WTW was delivered more than two months ahead of schedule and well under budget. The project received the prestigious Capital Project Management Award in December 2007 and the Saltire Awards for Civil Engineering in October 2008. According to **George Merry** of KWH Pipe: "One of the reasons that KWH Pipe, as a fairly small player in the ▶

▲ The project will improve the quality of drinking water for around 450,000 customers throughout Edinburgh and the Midlothian region. In the photo, sampling the goods: Neil McCulloch, Project manager, Capital Investment Delivery, Scottish Water.

▼ The pipe is pulled along very low friction rollers just outside the plant, from where it is tilted by pneumatic cylinders and rolled to a temporary storage rack. Due to the design, the pipes can be pushed by one person.

UK, has won these prestigious projects, is our ability to not only supply pipes, but to deliver a solution that allows customers to save time and money while working in an environmentally sustainable manner".

At Glencorse, construction will be even more efficient as the mobile production plant offered a continuous flow of pipe directly on site. George Merry said: "This shows how the long established partnering arrangement between Scottish Water, Black & Veatch and KWH Pipe can lead to significant cost savings in pipe production and installation techniques and at the same time, help reduce the carbon footprint in a major engineering project."

The solutions applied at the Glencorse project have been recognised. Black & Veatch has for example won the Best Innovative Idea award from Welsh Water at the utility company's 2009 Health & Safety Excellence awards for its Behavior on Safe Sites (BOSS) safety and health program.

Setting up the mobile plant

Rather than taking pipe from the production units in Europe, a mobile pipe manufacturing facility was set up adjacent to the actual construction site. KWH Pipe took over a small industrial property in Edinburgh's Green Belt next to the pipeline route and transformed it into an area for both on-site pipe production and pipe storage. The solution meant the inconvenience to the surrounding area associated with a large engineering project such as this was effectively minimized.

The mobile plant was delivered to the site in 14 containers. Once the containers arrived, the plant was set up and the containers were positioned around the plant as sound insulators. The mobile plant was housed in a large tent, 12 m wide, 65 m long and 6.6 m high. Raw material storage for the pipes was set up in an old unused storage facility and outside, only 100 metres from the pipeline route, storage areas for the pipes were set up. The plant required its own 1,000 kVA power supply, which was set up on the site.

Once the mobile plant was assembled, and the power supply was connected, production could commence immediately. The first pipes were manufactured on site 11th February 2009. The pipes were inspected for quality, and carefully measured and numbered. In terms of pipeline delivery, the cutting edge technology employed allowed KWH Pipe to manufacture and supply the pipe for the project twice as fast as it would take in a normal pipe production unit. 3,000 tons of pipe were manufactured during 6 months.

The pipes were manufactured in a continuous process on site. This meant than an extensive logistics chain with several time consuming stages such as loading and offloading delivery trucks could be avoided. The pipe could be taken directly from the production unit to the actual pipeline route on a constant basis, reducing the traffic on the narrow lo-

cal roads and eliminating the need for special deliveries or lifting equipment. This in turn meant that a lot of time and work could be saved, and made the work flow more smoothly. Producing the pipes close to the pipeline route helped reduce delivery trucks by an estimated 75% as construction vehicles could use the pipeline route itself to transport pipes and equipment. To transport the pipes on site, a telehandler with spider grab was used.

Long pipes a benefit

The pipes could be manufactured in significantly longer lengths than pipes that are delivered by truck, meaning fewer joints, reduced waste, reduced handling, and a reduction in the construction time.

Pipes manufactured for the Glencorse project were DN/OD 1,000 mm and 1,200 mm, supplied in both 14.5 and 22 metre lengths.

"The 22-metre pipes produced at the mobile plant are the longest pipes ever produced in the UK. Longer pipes mean about 500 welds less, which really simplifies the installation process on the whole and results in an extremely competitive overall installed cost. With fewer joints, the risk of leakage is also less. However, in case specifications change, we can produce pipes of any length and pressure class in sizes DN/OD 630 – 1,600 mm", says George Merry.

If pipes had to be delivered to the site by truck, the lengths would have had to be much shorter. "The local roads are not always suitable for large trucks transporting massive loads of pipe. Roads can be narrow and turns sharp. This means that if the pipes would not be manufactured on site, they would have to be cut into shorter lengths to accommodate for the road conditions", Site Manager **Vesa Penttilä** from KWH Pipe's Project Services department explains. The maximum pipe length for haulage in the UK is 13.5 m, hence longer length pipes are a major benefit of the mobile plant.

The reduced number of pipes, resulting from longer length pipes being used, also meant that less handling of pipes was required, and offloading requirements from vehicles were reduced.

Sustainable solution

The mobile production plant requires a domestic water supply and a 1,000 kVA power supply, but once operational, the pipe production process is waste-free. There is no waste stream or sewer requirement, as the cooling water system is a closed circuit and the water can be continually re-used. The polyethylene raw material is brought in pallets of 55 bags containing 25 kg of polymer each, and the pallets are returned to the manufacturer and the plastic bags and cutting swathe are recycled.

Although the mobile pipe production was set up to supply pipes for the Glencorse project, the mobile production plant was simultaneously able to deliver large-diameter pipes for other projects, maximizing the efficiency and use of the plant.

Once the mobile plant produced the needed amount of large-diameter pipe for the Glencorse project, the plant was dismantled, packed into containers, and removed to pave way for reinstatement of the site.

As the laying of the pipes continues, the mobile plant is now available for new projects around the world. By employing this innovative solution of extruding pipes on site, the Glencorse project team was able to reduce installation time and cost as well as the carbon footprint of a major engineering project. ■

The mobile plant set up at Glencorse to produce the large-diameter pipes on site helped reduce capital costs, manufacturing time, CO_2 emissions, pipe deliveries, pipe welds, handling and installation and minimised disruption of the local area.

Flexible pipes

the new way ahead for efficiency and cost savings

TEXT **Matti Välimäki** » PHOTOS **KWH Pipe** »

With the arrival of flexible pipes, district energy networks can now be built and repaired more easily and cost-efficiently than before. KWH Pipe Technology's turnkey production lines place you firmly in the driving seat of this groundbreaking new pipe technology.

KWH Pipe has been an active international player in plastic piping since the 1950s and is known as a successful pioneer of leading edge technologies and production models.

Back in the day, district heating pipes were laid in prefabricated concrete ducts. Development went from here towards laying preinsulated pipes directly into trenches. Now, it's all about preinsulated flexible pipes. As KWH Pipe Technology's Eastern Europe Sales Director, **Pentti Moilanen**, underlines, flexible preinsulated pipes mean considerable savings during the installation stage: "The long flexible pipes radically reduced the need for jointing, as they can measure up to several hundreds of metres in length. They can also be laid straight off a coil in the same way as cable."

"A flexible pipe can be easily laid without heavy machinery and can be looped under and around obstacles such as boulders and traversing pipelines. Flexible pipe is also easy to lay across hilly terrain," Moilanen continues. He also points out that when produced with a flexible stainless steel carrier pipe, the pipe is also ideal for high-temperature applications. "In Russia and Kazakhstan, for example, many district heating networks run high temperature pipes right to the doorstep. When it comes to network repair and extension, flexible preinsulated pipes containing a flexible stainless steel pipe are the ideal solution."

FLEXIBLE PIPE IS IDEAL FOR HIGH-TEMPERATURE APPLICATIONS

Costs savings through continuous pipe production

KWH Pipe Technology's Marketing Manager Tapio Alanen explains that flexible pipe can also cut production costs: "Flexible pipe is manufactured in a continuous process, which brings significant polyurethane savings".

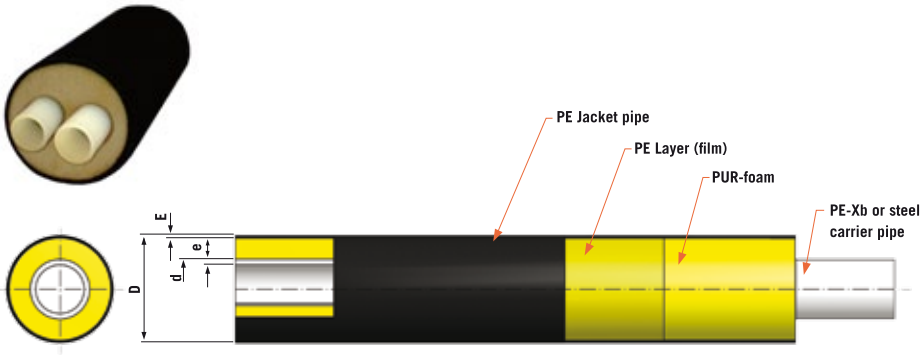
The technology also offers the possibility to produce preinsulated pipes in custom lengths according to customer needs. Several hundreds of metres of pipe can be run onto a single coil.

Project success in the Emirates

KWH Pipe Technology can deliver all components needed to build a turnkey production line for flexible preinsulated pipe, and the cutting-edge technology is stirring a lot of interest. Recently a flexible preinsulated pipe production line was delivered to Emirates Preinsulated Pipes Industries (EPPI) in the Arab Emirates, where the pipes are used

PRODUCTION LINE CAPACITY

Product: Production line for PU insulated flexible pipes
Size range: 16–110 mm
Output: 1.5–5 m /min
Structure: PEX or steel or PE/PU/PE-LD



PU insulated flexible pipe

for district cooling. The production line now produces preinsulated pipes in 100–300 metre coils with internal diameters of 16–110 mm.

General Manager of EPPI, Mr. **Ghassan Sahli** recalls the days when their pipes were imported to the Arab Emirates from Europe. The logical next step was to establish their own domestic production. The company contacted several different machine and technology suppliers. KWH Pipe was able to deliver the necessary technology and a comprehensive solution, which the competitors could not offer. "KWH Pipe's production model, in particular, in which the carrier pipe, insulation layer and outer coating are produced simultaneously in a continuous process, sets it above other similar products," explains Sahli. He also highly values the positive impact the production line has locally, as the pipes are manufactured using local labour and raw materials are produced in the Arab Emirates. ■

KWH PIPE, TECHNOLOGY

Product portfolio

1. Solid wall PO pipe production lines
2. Weholite production lines
3. DH-Pipe production lines
4. Flexible PU insulated pipe lines
5. Steel pipe coating lines (SPC)
6. Welding Machines
7. Blown Film lines
8. Franchising & Licensing

TEXT Anne Kytölä » PHOTOS Rita Lukkarinen and Bildstöm / Mats Sandström »

"KWH is successful because it has always been able to adapt to changes," say Peter and Henrik Höglund.

Three reasons to celebrate

2009 is a year of celebration for the 80-year-old KWH Group and for Peter and Henrik Höglund, who run the company. The brothers will turn 60 in December.

The Höglund brothers were 23 when their father, **Emil Höglund**, passed away. The relationship between the boys and their father was somewhat distant because the energetic businessman was rarely at home and the age difference was large. Nearly 50 when the boys were born, Emil seemed more like a grandfather than a father, and there wasn't enough time to develop a balanced adult-to-adult relationship.

The timber company that Emil Höglund and **Edvin Wiik** established on 28 August 1929 had been completely transformed by the time the elder Höglund died in 1973. Plastic had replaced wood and the company had grown and become more international.

"Father never said (at least to us) that he expected us to continue his work. Maybe we would have done something else if the company hadn't been right here," say **Peter** and **Henrik Höglund**.

Both boys were interested in economics: Henrik studied in Turku, Finland and Peter in Sweden. Along the way Peter also studied forestry. Although Wiik & Höglund no longer processed timber, Wiik & Höglund and Keppo still owned forest land.

Neither questioned whether to continue their father's work when deaths required that a new generation take over the management. Henrik became the Managing Director of Keppo after **Jukka Tidström** died in 1975. The young manager took control in the middle of the oil crisis.

"Times were just as tough then as they are now, and the last recession in the 1990s was also difficult," recalls Henrik. The company gave up many of its operations at that time and, for example, all activities related to fur production were sold off.

Peter had already worked at Wiik & Höglund's forestry department in the early 1970s and, after completing his studies, he returned to the company the same year as Henrik did – at the age of 25. He became Group President in 1998.

The challenge of diversity

In his role as Chairman of the KWH Board of Directors, Henrik believes that the decisions made in the past were the right ones. There is no need to regret the choices made concerning the company's main directions.

"We were able to move from one industry to another relatively well. The merger of Wiik & Höglund and Keppo was also a good solution."

Operating in many industries has always been a part of this company, and the brothers see KWH as a conglomerate in the future as well. It's a challenging and nerve-wracking road but it suits competitive people, and the Group President considers himself to be just this type of person.

"There's always at least one part of a conglomerate that is not doing very well. But this is also a good way to learn that crises are a normal part of business".

Drawing on rainy day funds

The Höglunds haven't lost hope regarding this economic crisis either. The situation is tough and it will get even tougher. Households will notice the recession next year when taxes rise, the number of unemployed continues to increase, and there's no more room for pay raises. However, Henrik and Peter are certain that KWH Group will come through the recession, despite the fact that sales have dropped in all countries to which the company exports its products.

"We've put aside some revenue for rainy days, and this will help us get by in the current situation. We're quite capable of handling a couple of slower years."

The company last recorded a loss in 1992 and, unless something unexpected occurs, the brothers expect this year to show a profit as well.

Ongoing change

The Höglund family owns a majority share of the KWH Group at this time, while seven per cent is owned by the Tidström family. The Höglunds believe that KWH Group will remain a family company – and unlisted – as long as family members are interested in company matters.

There is potential for continuation as several young family members are currently studying economics and technology. Henrik's son Carl-Henrik works in the group and Peter's youngest son Thomas has been a summer employee. The family is well represented in the group's company-specific boards of directors.

"The younger members of the family are learning as they work beside veterans on the boards," explains Henrik.

The brothers are certain that, 20 years from now, KWH will look completely different than today as it prepares for the company's 100th anniversary.

"The business functions that the company started out with 80 years ago have all been terminated or sold off. We can build almost anything out of the parts that exist today." ■

LIKE TWO PEAS IN A POD

It's easy to tell which brother is which on the day of this interview in August because Peter still has the moustache he grew in the summer. The brothers have also considerately dressed in different coloured shirts. But the black shoes are identical.

The brothers admit to taking advantage of their likeness just once: when they received their driving licences, only one of them had his picture taken – just changing his shirt in between photographs.

The Höglunds don't think that their similar appearance has caused any confusion at the workplace. The identical twins also believe that employees can distinguish between them, but Secretary Anne Sjöblad reveals that many people still ask her who is who.

"A funny thing happened once when I told some visitors that Peter wasn't in the office and Henrik walked past me at the same time. The look on their faces was priceless."

At sea since childhood

There are differences in the way the brothers spend their leisure time, but their preferences are very similar. The sea, music and exercise are an integral part of life for both.

Pictures of a sailing boat decorate the walls of Peter's office; with the skipper even visible in one of them.

"We've been boating since we were little boys – for 53 years altogether," calculates Henrik.

They started out with a little outboard motorboat, but now Peter has a 35-foot sailing boat while Henrik has a 39-foot motor boat.

Peter sings second tenor in a choir and has been singing in choirs for more than 25 years. Henrik used to play the acoustic guitar but now Spanish studies take up all his free time.

Peter boasts of being a few kilograms lighter than his little brother, who was born a few minutes after him, because studying Spanish has forced Henrik to cut back on his exercise. After competing in ultramarathons of up to 100 kilometres, Peter now keeps fit by roller skiing to work a few times a week from his summer cottage. ■

TEXT Niels Christian Maare ›› PHOTOS KWH Pipe ››

Energy efficiency with Weholite

Utilizing geothermal air heating will ensure a good indoor climate at Dybbøl School in Sønderborg, Denmark.

Most of Dybbøl School in Sønderborg, Denmark burnt down in a fire in October 2007. As part of the rebuilding process, the decision was made that this would become a very energy efficient and environmentally friendly building, with optimal heating, insulation and general indoor climate solutions being sought.

OBH-Gruppen in Odense – which acted as advisor on the project – were given free hands when it came to proposing solutions for the project. They chose to use a so-called geothermal air heating system in combination with a ventilation and air-conditioning system, and were one of the first companies in Denmark to do so. According to OBH-Gruppen, until now this solution has only been used in a few projects in other countries.

Weholite satisfies all the requirements

With a geothermal air heating system you exploit the constant temperature of just under 10°C, which is the earth temperature at a depth of 2 metres. This allows you to save a great deal of energy since the air in the system is then adapted to the desired indoor temperature – in other words it is heated in winter and cooled in summer.

For this solution OBH-Gruppen recommended using pipes that could withstand high external pressure, that a layer of 2 metres certainly provides; the pipes also needed to have a smooth internal surface to enable the air to circulate optimally.

The contractor for the project, Chr. Johansens eft., and Davidsen Tømmerhandel building merchants, opted to use Weholite pipes from KWH Pipe, since these pipes satisfy all the essential requirements of the project.

Weholite pipes also stand out from the crowd, due to them being very easy to handle and customize to the conditions of the site they will be laid in, not to mention the fact they can be welded, which means 100% tight seals. Furthermore, Weholite pipes are manufactured and supplied in long lengths – in this case up to 16 metres – which reduces the number of joints (speeding up installation) and the number of deliveries (good for the environment).

The company´s Project Services department was heavily involved in the project since drawings and calculations had to be prepared before the work could start, in addition to the mobile welding team being responsible for all cutting and jointing on site. ■

New land needs new pipelines

TEXT **Tina Hellman** » PHOTOS **KWH Pipe** »

Gibraltar, set on the southern tip of the Iberian Peninsula, is one of the most densely populated territories in the world. To satisfy its constantly mounting demand for space, new land is being claimed and created where sea and riverbed once washed. At the Mid Harbour Reclamation site, Van Oord Dredging and Marine Contractors is installing stormwater outfalls and extending the existing pipe network to accommodate the new development being constructed on behalf of the Government of Gibraltar. The piping solutions for the project are supplied by KWH Pipe.

KWH Pipe's Project Services department provided a complete solution for the stormwater outfalls, including project management, design, welding, installation instructions and installation supervision. The project consisted of two pipelines, DN/ID 2,000 mm and 1,200 mm respectively. "We chose to work with KWH Pipe as they have a very proactive attitude and offer good service," Mr **August Runge**, Project Manager at Van Oord comments.

The pipes for the stormwater outfall were delivered from the factory in Poland, where as much as possible of the pipeline was prefabricated (fittings, bends, inspection chambers). The different sections of the pipeline were then welded together on site, and lifted into ready-prepared trenches.

Polyethylene shortens the execution time

Due to their light weight, Weholite pipes, made of polyethylene, are easy to install and can be produced in significantly longer lengths than traditional materials. "We also considered using concrete, but polyethylene shortens the execution time considerably," explains Runge.

Once laid, the Weholite pipes were then connected to the existing concrete pipe network. Polyethylene pipes were a superior choice for the new pipelines due mainly to the site's sandy soil conditions. Weholite pipes are flexible, which enables them to adjust to different loading conditions, vibrations, stresses and soil movements without incurring damage.

To weigh down the pipes, the hollow profile walls of the pipe were filled with a non-hardening cement mortar mixture, thus ensuring that the pipes retain their natural flexibility.

The Project Manager for Van Oord, Mr. Runge, was very pleased with the project and the cooperation with KWH Pipe, and is confident the two companies will work together in the future.

Custom-made solutions

Christian Vestman, Manager, Project Execution, explains how the Project Services department works: "We can offer custom-made solutions for large-diameter piping projects, from planning and design to installation. Project Services can provide expertise concerning mine tailings and slurry pipelines, marine outfalls and intakes, relining, sewage, drainage and a number of other application areas and can be of assistance in any phase of a piping project, or take full control and handle a project from beginning to end. By combining the excellent properties of plastic piping with experience and engineering skills, customers are ensured a cost-efficient and long-lasting solution." ■

Båtstø enters a new age

TEXT **Matti Välimäki** » PHOTOS **KWH Pipe** »

The village of Båtstø in Hallangen, Norway, is stepping boldly into a new era of green self-sufficiency. More than two hundred of its homes have now been connected to the village's very own brand new communal wastewater treatment plant.

This is picture postcard country. Below, the Oslo Fjord looms dark blue, the mountain face rising starkly from the sea. A thin road winds its way through densely wooded slopes, while far out on the horizon, a lone sea eagle soars over the open sea. A magnificent place to live.

To the civil engineer's eye, though, this breathtaking landscape presents a steep challenge. A few years ago, the residents of Båtstø decided that the time was right to bring some basic mod cons to the village: running water and clean wastewater. "The villagers pulled together to get the planning office onto the job. What at first seemed a sheer impossibility gradually began to take shape and to actually look doable," recalls Project Engineer **Dick Söderbacka** of KWH Pipe's Environmental team.

Hidden underground

Today, following lengthy planning, permit applications and project tendering phases, the slopes of Båtstø are equipped with a WehoPuts 1020 treatment plant. The plant, fabricated at KWH Pipe's factory in Vaasa, is equipped with three large 19-metre long tanks plus a distribution tank and has the capacity to clean the household wastewater from more than two hundred homes in the village. The only thing visible above ground, though, is just a few small aluminium covers.

"The two most important criteria for the client were capacity and reliability, but they also valued the fact that the plant blends so well with the sensitive natural landscape of the area. On top of that, the plant produces no odour emissions. When the process

WEHOPUTS 200–1200 VILLAGE-SCALE WASTEWATER TREATMENT PLANTS

- Bio-chemical household wastewater treatment plants
- System includes one or more ground-installed horizontal tanks and process equipment
- Distribution unit also included for systems comprising multiple treatment plant units
- Large reserve capacity for load surge control
- Durable, fully air/watertight construction
- Pre-assembled, ready-to-install units
- Quick to install, no additional structures or building work needed
- Remote monitoring system

works as it should, the only smell produced is a mild damp soil odour." says Söderbacka.

The large treatment plant was built in Finland and shipped to the plant distributor Ecobio AS in Norway, who took over the practical end of things there. "Ecobio also provides the plant maintenance. The plant is also fitted with a remote monitoring system to enable real-time close surveillance of the plant operation," explains Söderbacka.

Easy to install

Ecobio is already a known name in Norway. The company imports smaller WehoMini treatment plants from KWH Pipe in Denmark, as well as larger 50–200 person capacity plants from Finland.

"The high quality of the product is easy to ensure because the plants are prefabricated in controlled factory conditions. It was also important for the customer that the installation work was quick and straightforward, taking just a few days," emphasises Dick Söderbacka.

The ease of the treatment plant installation has come as a welcome bonus to the village, especially as the other remaining phases of the project are considerably more demanding.

The project involves the laying, both overground and in trenches, of more than twenty kilometres of flexible pipe with freeze protection heating cable. In addition, a pumping well is being installed at each household. "KWH's part in this project was the treatment plant," says Söderbacka.

The project will reach completion in around 12 months, after which the WehoPuts 1020 treatment plant will be able to run at full capacity.

A growing interest

The treatment plant delivery to Norway is KWH Pipe's biggest plant to date. A slightly smaller plant is located on the other side of the Oslo fjord.

Interest in the technology is growing in Norway. "There is a clear need for village-scale and small-scale wastewater treatment plants in the Nordic countries. It is expensive to build municipal wastewater systems and long-distance sewage pipes in sparsely populated rural areas with difficult terrain. Demand for similar solutions elsewhere in Europe is also likely to be high," says Söderbacka.

Wastewater phosphorus regulations are a little tighter in Norway than in Finland, but, according to Söderbacka, WehoPuts 1020 easily meets the mark. In Norway, interest in communal wastewater treatment plants is also being boosted by the fact that many municipalities have begun pressuring villages to resolve their wastewater problems – in some cases even under threat of considerable fines.

"But way and above the most important factor here, I think, is the Norwegians' community spirit – their ability to pull together. Many residents have an enthusiastic hands-on approach and are ready to get involved in projects and to work for the common good of their village," Dick Söderbacka concludes. ■

TEXT Sukhi Dhillon and Brian Gallagher » PHOTOS KWH Pipe »

The City of Las Vegas expands with Weholite

The City of Las Vegas Water Pollution Control Facility is located 16 km east of the world-famous Las Vegas Strip at 6005 East Vegas Valley Drive. The first wastewater treatment unit at the City's new Water Pollution Control Facility began its operation in 1958. Today, the Water Pollution Control Facility treats an average of 240,000 m³/d (63 million gallons per day), with the capacity to treat up to 340,000 m³/d (91 MGD).

The City of Las Vegas Water Pollution Control Facility treats wastewater generated by more than 650,000 residents and businesses in Las Vegas and North Las Vegas, to meet and exceed discharge permit standards. The cities of Henderson and Boulder City, and unincorporated areas of Clark County, Nevada, are each served by separate treatment plants.

The Engineers' Challenge

The Effluent to Channel Pipeline project consists of the decommissioning of approximately 366 m (1,200 feet) of existing trapezoidal effluent channel, furnishing and installing a new pipeline with junction structures, flow control gates, static mixing system, flow monitoring, and chemical dosing system and controls.

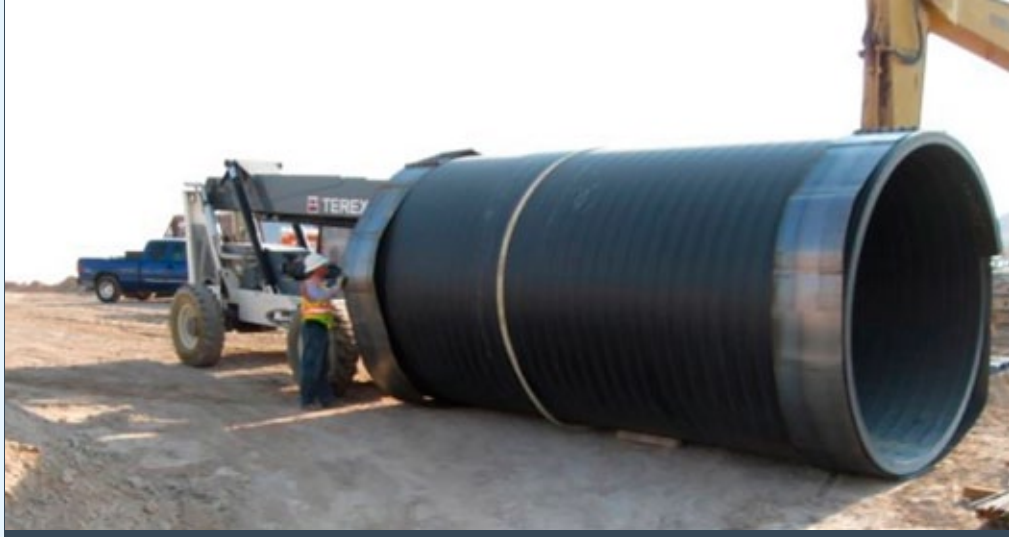
The City of Las Vegas tasked Black & Veatch to design a DN/ID 2,700 mm (108") pipeline to meet the facility's future capacity requirements. GRP pipe and Weholite PE-HD structured-wall sewer pipes were specified as the approved materials. The contractor, JNJ Engineering Construction selected the Weholite PE-HD piping system over GRP due to the advantage of installing longer lengths, which meant fewer joints and added cost savings.

The project consisted of installing a DN/ID 2,700 mm Weholite pipe along with a myriad amount of Weholite fittings including two 1,800 mm (72") Weho manholes in a very constrained working environment. The depth of the pipe trench was a concern; therefore, the design of the trench had to incorporate a very flat slope. In addition, deep connections to the junction structures were utilized in order to tie in the existing chlorine-contact-basin outlet pipes.

The City of Las Vegas had to maintain the existing effluent channel, which consisted of chlorinated effluent and the dechlorination system prior to discharge to the Las Vegas Wash. The ability to install a pipe between

existing chlorine contact basins and the effluent channel was critical in keeping the existing effluent channel operational continuously with chlorination for disinfection and dechlorination to meet the wastewater treatment permit. All this had to be done with very limited down time during the construction.

With the selection of PE-HD pipe, combined with controlled low strength material (CLSM) backfill, the contractor installed the pipe with relative ease. Prior to excavating, the groundwater had to be lowered below the designed invert elevation. This dewatered groundwater was returned to the process location of the treatment plant. Due to the installation speed of Weholite, the trench was closed up in very short time and access was re-established to plant in a timely manner. ■



PLANNING FOR TOMORROW

Southern Nevada's unprecedented population growth, combined with the dynamic nature of permitting requirements, means Environmental Division staff must continually look ahead to meet future needs. Since 1989, more than $170 million has been spent to improve and expand wastewater treatment processes and more than $30 million has funded projects to eliminate odors generated at the Water Pollution Control Facility. Southern Nevada's plan for the future led to the creation of the Clean Water Coalition (CWC) and the Systems Conveyance and Operations Program (SCOP).

SCOP (pronounced *scope*) is the Systems Conveyance and Operations Program. It was initiated to address the need to provide alternatives that would protect water quality in the Las Vegas Wash and Las Vegas Bay and Lake Mead. The Nevada Division of Environmental Protection monitors both the water quality in Lake Mead and the progress of the CWC SCOP project. KWH Pipe has a future opportunity to provide Southern Nevada with Weholite PE-HD piping solutions from DN/ID 2,400 mm (96") to 3,000 mm (120").

Effluent (highly treated wastewater) is currently discharged into Lake Mead via the Las Vegas Wash. Effluent has been discharged into Lake Mead via the Las Vegas Wash for approximately 40 years.

In 2004, SCOP was deemed necessary for many reasons. The water level in Lake Mead has fallen consistently over the past decade. As this continues to occur, the capacity of Las Vegas Bay to accept effluent discharge, and the dilution capacity of Lake Mead, decreases significantly. This will affect water quality throughout the entire system.

Lake Mead is a national recreation area, and maintaining water quality in the lake for health, safety and recreational purposes is an important aspect of the Boulder Basin Adaptive Management Plan as well as the SCOP project. SCOP will also benefit the water quality in the Las Vegas Bay by removing much of the effluent from the Las Vegas Wash.

Returning water to the Colorado River System allows for Return Flow Credits. Nevada is allotted a set amount of Colorado River water each year. However, each acre-foot of water returned to the Colorado River System is an additional acre-foot of water Southern Nevada is allowed to use for the Las Vegas valley. Returning reclaimed and highly treated effluent to Lake Mead ensures that Southern Nevada can utilize as much Colorado River water as allowed and that we are wisely managing and protecting our limited water resources. ■

From the Crew at JNJ Engineering Construction

"KWH Pipe, I just wanted to write and say thank you for a job well done. Your 108" Weholite pipe proved to be the perfect product for our CLV WPCF project. The pipe passed the deflection and pressure tests flawlessly. Weholite was easy to cut, fit and weld together which made for the perfect combination for this particular project. The KWH regional sales representative, construction engineer and KWH Pipe field service technicians were all very knowledgeable and conducted themselves with a high level of expertise and efficiency; always willing to go the extra mile to make this a successful project. JNJ Construction Engineering successfully installed the Weholite pipeline in a fraction of the time originally estimated based on other material designs. We will look forward to our next project with KWH Pipe."

– Thomas Holm, Project Manager

PE-HD best solution for a submarine application

TEXT **Pornthep Mungsuikhum** » PHOTOS **KWH Pipe** »

The Rosedale Wastewater Treatment Plant in Auckland, New Zealand is upgrading its facilities and its associated sewer network. Wiik & Hoeglund, KWH Pipe's subsidiary in Thailand, is delivering PE-HD pipe for a new outfall and a submarine pipeline.

The Rosedale Wastewater Treatment Plant in the north of Auckland is amongst the largest in New Zealand and provides primary, secondary and advanced treatment of effluent for around 220,000 inhabitants in the region. Due to population growth, from 1.2 million inhabitants in 2003 to an estimated 1.6 million by 2020, and increased environmental awareness and tighter environmental legislation, the Auckland area is experiencing changes in the way wastewater is treated.

To give a measure of the sheer scale of the increase in wastewater treatment requirement in the area, population growth has meant that whereas in 1962, when the Rosedale plant was built, the plant was required to treat wastewater from 70,000 inhabitants, in 2020 this figure is estimated to reach 253,000.

PE-HD chosen for flexibility and durability

A part of the treatment plant upgrade project is the construction of a new outfall and a submarine pipeline. Wiik & Hoeglund delivered 1,560 metres of DN/OD 1,600 mm PE-HD pipe, SDR 26, PN 6.3 to the project, of which 600 metres were used as a submarine pipeline connection from the plant to the sea, and the rest for the outfall. The pipes were chosen due to their flexibility and durability. In addition, the special characteristics of the carbon black compounded PE-HD material, including its resistance to salt water and UV light, made it the most suitable material for the submarine application.

McConnell Dowell Construction Ltd, the main contractor for the project, confidently chose PE-HD pipe from Wiik & Hoeglund due to these characteristics and for its high quality. The pipe was manufactured in Thailand in compliance with the AS/NZS 4130 standard as per requirement from the North Shore City Council.

Welding included

Wiik & Hoeglund's subsidiary was also chosen to provide the welding work during October 2008 to March 2009. The pre-constructed pipe was laid in a dredged trench and the marine pipeline also included a 300 metre long diffuser section. The construction of the Rosedale treatment plant is now completed and the WWTP can continue operations with a maximum water treatment capacity of 19.7 million m^3/year. ■

TEXT **Noppadol Dhammaniyom** » PHOTOS **KWH Pipe** »

Weho tanks help cut electricity bills in Lumtup and Praipraya provinces, Thailand.

Bringing power costs to heel with Weho tanks

Univanich Palm Oil (Public) Company Limited, the biggest palm oil manufacturer and refinery in Thailand, has been delivering oil and fruit products throughout Thailand, South East Asia and Australia since 1969. As a part of extensive rationalization measures, Univanich launched a large-scale project targeted at controlling and lowering one of the company's largest single cost components – electricity. In 2009, the company came up with the idea of using biogas, a co-product of its production process, to fuel its electricity generator system and, in doing so, to take a considerable leap towards energy self-sufficiency.

The project brings a significant cut in the monthly electricity bill of each of Univanich's plants. The biogas project has also gained governmental support.

Designed to requirements

To install the biogas electricity plant, large bio-filter tanks were needed. Specialist biogas system designer, Jiampattana Energy Company Limited, was assigned as designer and consultant for the project. They settled on using Wiik & Hoeglund's Weho tanks, which can be custom designed according to specific customer needs.

WEHO TANKS CAN BE INSTALLED THREE TIMES FASTER THAN TANKS MADE OF GRP OR CONCRETE AND HENCE CONTRIBUTE TO CUTTING COSTS.

Once the designs were received, Wiik & Hoeglund consulted with Jiampattana Energy to finalize the design, and then assembled the Weho tanks ready for installation at the biogas project site.

The main bio-filter tanks were DN/ID 3,000 mm and 10 metres tall. The Weho tanks were equipped with several sets of biogas filters with medias to retain the gas inside the tanks and protect the generator.

Impressive installation speed

A total of six biogas Weho tanks were installed at Univanich's production plants in Lumtup and Praipraya provinces during August 2009. According to Mr. **Sivasak**, Designer at Jiampattana Energy, the PE-HD Weho tank is highly efficient and its material characteristics give it superior chemical acid and biogas resistance compared to iron or GRP. Since PE-HD has a more than 50-year service life, the project owners can also rest happily knowing that the project will cut costs over the long term.

"The installation speed is quite impressive for a biogas tank system," says Mr. **Udomsak Lohachitpitaks**, owner of Jiampattana Energy International Co., Ltd., who goes on to note that Weho tanks can be installed three times faster than tanks made of GRP or concrete and hence contribute to cutting costs.

The project has also sparked interest in other industrial segments, and Wiik & Hoeglund is currently adapting the Weho tank concept to a range of other industrial and civil engineering applications. ■

TEXT Tina Hellman » PHOTOS KWH Pipe »

Giant pipes for French power plant

Alstom has built a 420 MW Combined-Cycle Power Plant for Suez Group's independent power producer (IPP) Electrabel France. For the plant's piping systems, Alstom chose to work with KWH Pipe, following their previous experiences of the pipe expert's first-rate solutions and systems.

Combined-Cycle Power plants are the preferred choice of IPPs entering the newly deregulated French market, as they offer a highly flexible power solution for covering peak demand. A key component in the construction of power plants is the cooling system. KWH Pipe has delivered a complete package for Alstom including hydraulic and strength calculations, material supply, welding and assembly work, and the installation of the cooling water intakes and discharge outfall at the CombiGolfe power plant.

Weholite pipe is one of the few polyethylene pipes in the world that can be produced in dimension larger than two metres.

Weholite has outstanding properties

CombiGolfe is the second combined cycle power plant constructed by Alstom in Fos-sur-Mer, France following the construction of the Cycofos power plant built for Gaz de France in 2006 just a few kilometres away. The Cycofos project marked the start of a good relationship between KWH Pipe, Alstom and their subcontractors.

In the Cycofos project, KWH Pipe designed and provided four double intakes for the power plant. Following from the success, this second project at CombiGolfe was even larger in scope. On site, KWH Pipe worked with Alstom's subcontractor DTP Terrassement, a subsidiary of the large construction group Bouygues.

Weholite pipe, which was used for the project, is one of the few polyethylene pipes in the world that can be produced in dimensions larger than two metres. It has all the advantages of a polyethylene pipe; it is flexible and well-suited to dynamic environments, and it is lightweight and fast to install. In addition, the pipe does not corrode – a key factor when installing pipes in salt water. What makes Weholite unique, and especially suited to marine projects is that it has a hollow profile wall that can be filled with a cement mortar mixture that stays flexible.

Cooling intakes

For the cooling water intakes two 210 m lengths of Weholite DN/ID 2,200 mm SN 4 were used. KWH Pipe provided welding, assembly and weighting, and also supervised on site to ensure each phase was kept to plan.

The Weholite pipes were delivered to the project site from the factory in Poland in 13.3 m lengths. The intake pipelines were welded together on land in two 210 m lengths at a site 8 km from the installation site. The welding site was managed by the contractor Entreprise Jean Negri & Fils, who also installed the intake pipelines. Normally, external weights are used to weigh down PE pipes, but as the pipes are larger than two metres in diameter and are to be buried under the seabed, this was not an optimal solution. Instead, KWH Pipe used its patented profile filling method. The technique involves filling the space between the double walls of the Weholite pipe with a non-hardening cement mortar, thereby creating sufficient weight to hold the pipe in place while it is lowered into position. At the same time, water is allowed to flow into the pipe from one end. The use of Weholite in combination with this method ensures that the pipe retains its built-in flexibility, which means that the pipe can handle seabed stresses better than rigid pipes.

The entire project, including welding and profile filling, took approximately 5 weeks in total.

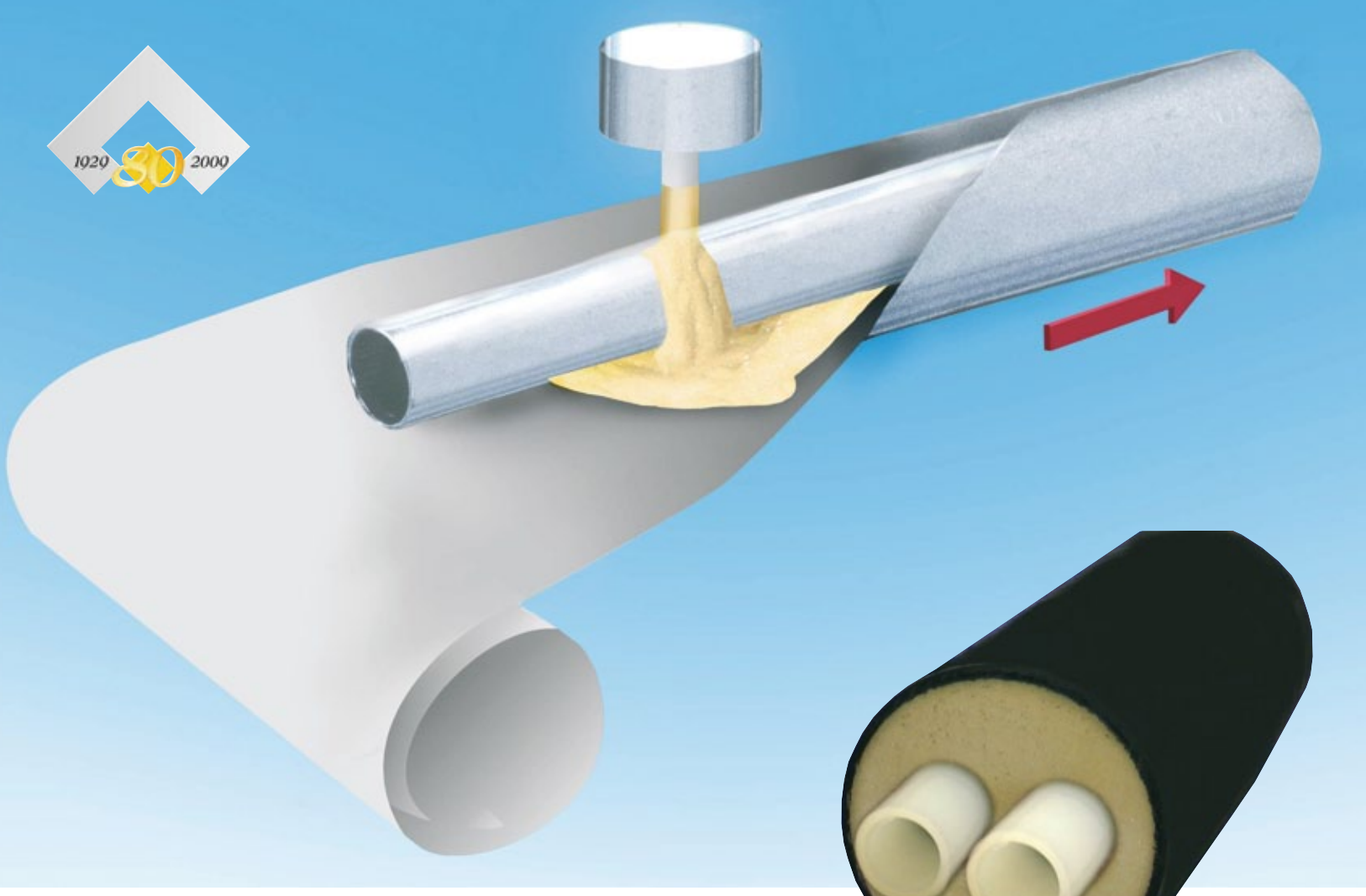
The intake pipelines were installed in May 2009. With the help of mobile cranes, the pipes were lifted into the sea from the quay located beside the welding site. The pipe sections were then towed to the power plant site using pontoons and tugboats, where they were positioned and submerged into a dredged trench. The outer ends of the pipelines were installed 16 metres below surface. The entire installation phase went off smoothly and took just a few days.

Land outfall

The land outfall for the CombiGolfe power plant, consisted of 840 metres of Weholite DN/ID 2,400 mm, complete with fabricated fittings: 45° and 90° bends and Weholite DN/ID 2,400 mm/1,800 mm tees. Five inspection chambers for the land outfall were made from DN/OD 1,000 mm WehoPipe. KWH Pipe was also responsible for the design, welding work and mortar filling as well as for supervising the installation phase.

The welding works for the land outfall started in the beginning of December 2008. The actual installation work was conducted by DTP Terrassement under KWH Pipe's supervision. The welded pipeline was installed in parts on three separate occasions. To move each section of the pipeline into place, 12–16 mobile cranes were needed as the pipeline was lifted into a prepared trench leading from the power plant to the sea.

KWH Pipe's Project Services department was pleased with the project result, with all work on the land outfall being successfully completed by March 2009. ■



Production lines for flexible PU insulated pipes

Flexible PU insulated pipes are manufactured on a continuous production line. The production machinery ilcludes decoilers, a film infeed unit, a 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 jacket pipe during the PE extrusion process.

For our customer, flexible PU insulated pipes provide a number of benefits including excellent mechanical properties. Continuous production enables long delivery lengths that are easy to transport, handle and store. The flexible pipe can be laid directly in the ground and requires smaller trench dimensions. Online extrusion ensures a watertight, chemical resistant and corrosion free jacket pipe.

KWH Pipe Technology provides turnkey production lines for the following products:

- Extrusion lines for PE/PP
- Welding machines for PE/PP pipes
- Steel Pipe Coating
- Franchising concept
- Extrusion lines for PE-Xa pipes
- Weholite licensing
- Blown film lines

Product
Product line for PU insulated flexible pipes

Output
1.5-5 m/min

Size Range Carrier Pipe
16-110 mm

Structure
PE-Xa or PE/PU/PE

Main applications:
- district heating and cooling
- house connections
- agriculture
- plant construction, oil and gas pipelines
- heat and plumbing

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