

Leaking pipes repaired at the speed of light

Deep in the Västerbotten forest Inpipe is demonstrating its fibreglass-reinforced pipe for 30 customers, mainly foreign. Most of them have already tested and used Inpipe's plastic liner for wastepipes. But here the liner is being applied to an old culvert under the railway, a new application area for the visitors.



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It is a distinguished visit to little Vännäs near Umeå where a marquee tent stands in the middle of the forest. Just behind is a tracked vehicle at the side of the southbound rail line. Four men from the Railcare Group, among them Kurt Boström, are

climbing around the ditch and rail embankment. They have just finished installing an Inpipe plastic liner in an old culvert under the embankment.

"We will now show the visitors the finished product," says Kurt Boström as he climbs over the

rails.

On the other side of the embankment, the hardened pipe liner is protruding about half a metre out from the culvert. Kurt Boström says that he and his work colleagues have installed 350 fibreglass liners since 2003, when the partnership between

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Photo: Bitte Torbjörnsdotter.

The tube of UV lamps is mounted at one end of the fibreglass liner and pulled through the culvert at a speed determined by the diameter size. The rays activate the hardening process.

Inpipe and the Railcare Group began. Inpipe's commercial product as been on the market since the 1990s. The original product was another type of impregnated fibreglass liner. After a long development process nothing remains of the old production method.

"We now have a new method that works very well on our unique product. The unique thing is that it is extremely flexible. Imagine a 300-millimetre concrete pipe that's been in the ground for 100 years and all the bits that have corroded away during that time. Our product always goes flush against the old pipe, regardless of whether the culvert is square or irregular. The liner always expands fully to the inner wall, which is very important because we can't have gaps in between," explains Inpipe's CEO Olle Karlsson.

The secret is in the UV rays
It took just eight hours for Kurt Boström and his team to install



Photo: Bitte Torbjörnsdotter.

Inpipe's CEO Olle Karlsson says it has been a long development process but they now have a world-leading and well-known product.



Photo: Bitte Torbjörnsdotter.

Kurt Boström creeps along the pipe liner to check it. Installation has as usual taken around eight hours, which is a significant timesaving compared to conventional digging.

the liner, unbeatable compared to conventional digging. The explanation is in the ultraviolet rays used to harden the liner. Hardening takes place after the liner is pulled through the pipe. One end is blocked and the liner is expanded with compressed air. The Railcare team do this with the help of a unit on the tracked vehicle that inflates the fibreglass liner until it is flush with the sides of the culvert. The UV carriage then takes over. A motor drives the six lamps through the pipe at a preset speed and hardens the liner.

"The greater the diameter the slower the speed. It works just

as well in cold weather because the lamps warm it up. Installation is always problem-free, which is quite amazing," says Kurt Boström.

This particular liner has a diameter of just over 800 millimetres and is 21.5 metres long, a bit longer than the original culvert's 19. According to Dan Magnusson, CEO of the Railcare Group, Inpipe's culvert renovation is half the cost of conventional digging.

"This method has shown to be much quicker and cheaper. A liner like this costs around SEK 10,000 a metre to install," he says smiling.



Photo: Bitte Torbjörnsdotter

The Railcare Group led by CEO Dan Magnusson (left) has developed a new application for Inpipe's fibreglass liner. Here seen with Emil Burén, Supervisor at RailCare. The pair are very pleased with the culvert renovation that has cut the usual cost by half.

One step ahead in the size race To stay ahead in the race, production equipment for larger dimensions will soon to be put into operation at Inpipe's plant in Vilhelmina. When the Railcare Group needed to increase the dimensions of the liner to up to 1,600 millimetres, the partners formed a joint venture to build new equipment.

"We now have the capacity for 150 millimetres up to one metre. But we have developed a completely new process for really large fibreglass liners," ex-

plains Olle Karlsson. He says that many players harbour doubts about the larger sizes like 1.6 metres, but most change their minds after seeing the results. He points out that the partnership with the Railcare Group has given Inpipe a good lead over competitors with regard to large culverts. In the same way as the production equipment has changed so has the ownership of the northern Swedish company over the years. It all began with Vollmar Jonasson via a Japanese consortium. Inpipe is now owned by Danish

Arkil AS. Inpipe's main focus is still on fibreglass liners for wastepipes, 200 and 400 millimetres in particular because they have the largest volumes. "We've operated on the wastepipe market for many years but were not the first to renovate from the inside. But we are increasing our focus on the large drain market under roads and industrial plants," reveals Olle Karlsson.

Tough demands on partners Initially, Inpipe focused a good deal on wastepipes in properties but Olle Karlsson says it is not possible for the company to make any great inroads on that arena.

"There are both cheaper and simpler products on the market so there doesn't seem to be a need or a readiness to pay for our liner. Our product is simply too good. But we get new enquiries every week," he says. And the results speak for themselves. It is a global market from which partners are carefully se-

Facts/Inpipe

Business Concept: To repair damaged waste and drainpipes using an expanding fibreglass liner that is hardened by UV rays.

Ownership: Wholly owned by Arkil AS in Danmark since 1999.

Head office and production plant: Vilhelmina, in which SEK 7 million was recently invested.

Turnover 2007: Around SEK 50 million.

Number of employees: Twenty-five in Vilhelmina but a total of 400 working with the Inpipe concept worldwide.

Partners: Inpipe has 20 partners who market, sell and install Inpipe products. On the Swedish market they are NCC, Puls and the Railcare Group. These three are Inpipe's most important clients.

Largest volume: Around 60 per cent consists of fibreglass liners for wastepipes of standard dimensions 200 and 400 millimetres.



It is time for the Railcare team to remove the UV carriage pipe and the compressed air hose from the pipe liner. All that remains is to cut the excess fibreglass liner and receiving hose.

lected in Europe, eastern Asia and the Middle East. Inpipe's products are marketed, sold and installed solely through these professional partners. A partnership entails buying the special installation equipment for around SEK 3 million.

"We have twenty or so leading partners worldwide, all of whom have made great progress. We're actually going to increase our number of partners, but not in Sweden," says Olle Karlsson. There have only been three partners in Sweden since 1993. NCC is one of them. Lars Webering from NCC Stockholm has been invited to Inpipe's demonstration. Lars is Business Manager and is in charge of two repair trucks that repair wastepipes between 150 and 800 millimetres in diameter.

"The greatest problem in Sweden is the 160,000km of old drains. To repair using conventional digging methods would cost up around SEK 350-400 billion. A 100-metre stretch that takes

two to three months using conventional methods we repair in a day with a liner. The most positive aspect is there is no excavation to cause traffic delays," he says.

Speed is of the essence. Lars Webering says the fibreglass lining is extremely durable. Inpipe also claim that their lining is stronger than the original pipe despite not being any-



The fibreglass liner is perfectly flush with the culvert wall and is perfectly shaped to the square bit in the middle and the rounded ends.

Photo: Bitte Torbjörnsdotter.

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where near as thick. According to Olle Karlsson, this has been confirmed by independent tests conducted by a number of European institutes.

“We have also designed an earthquake-resistant product for the Japanese market. Our product won’t cope with the large quakes but definitely the smaller ones.”

Other guests who travelled a long way also verify the liner’s durability. Joe Doyle represents Irish USSR. He described a 100-year-old culvert under the streets of Belfast that was repaired using a fibreglass liner.

“The original culvert was built from bricks and egg-shaped, so the liner fitted a treat. As well as being strong the product is also frictionless.”

Mr Doyle goes on to say how the water-flow capacity is barely affected. The liner does not reduce the diameter to any appreciable extent and the surface is very even. John de Rosa from Subterra in England greatly ap-



Photo: Bitte Torbjörnsdotter.

Lars Webering (left) is Business Manager at NCC Stockholm. NCC often repair pipes in areas with a high traffic density. They greatly appreciate this non-excavation method because it does not cause traffic delays.

preciates the rapid technology, as experienced from an extensive renovation of the wastepipe system in central London.

“With the tube and overhead rail systems adjacent and above, speed was of the essence. We only needed to shut communications over three weekends and installed 450 metres in that time, so the liner was a success,”

he says.

No environmentally hazardous materials

John de Rosa says that as the product is so environmental it can be used for many more applications in England. Furthermore, as the technology only consumes a fraction of the energy used in conventional dig-



Photo: Bitte Torbjörnsdotter.

Irish USSR were invited to Inpipe’s demonstration. Joe Doyle (left) thinks the product’s quality and installation speed are far superior. The strength of the liner is the most positive aspect.

ging, Inpipe guarantees that no hazardous particles impact the water quality, not even during the installation process. The company carries out regular air checks during the manufacturing process.

“People do sometimes react to the styrene odour in the plant, but we are way below the permissible limits and we have launched a new type of film that will make the liner completely odourless,” explains Olle Karlsson.

It is time for Kurt Boström to cut off the excess liner where the compressed air bottle and UV carriage sat. This is done with a grinder, which gives off quite a bit of dust.

“We normally wear face masks but they’re not really necessary. We also take the bits we drill out in order to verify the thickness and strength,” explains the former electrician.

The visitors on the embankment make their way through the mud to get a closer look at the stone-hard liner. This is followed by a closer look at “wild” Vilhelmina. Sune Andersson, local motorcycle celebrity, serves hamburgers at the marquee.

The wilds are an attraction “We ended up in Vilhelmina by pure chance. Even in 1988 when the factory was built it was complicated to say the least. This is why we invested in the site and stayed here. We definitely have no location problems because transport costs for products and raw materials are quite low,” says Olle Karlsson.

The investment at the plant could lead to new jobs in the long-term, but Inpipe is already the second largest private sector employer in the region. The CEO himself sees a great advan-



Photo: Bitte Torbjörnsdotter.

The Railcare Group cut off the excess fiberglass liner with a grinder. There is quite a bit of dust but a face mask is not deemed as absolutely necessary. The product is not regarded as hazardous.

tage in the beautiful wilds. “We often take the opportunity to invite foreign visitors here to our beautiful natural surroundings. But the purpose of the today’s invite was to demonstrate how the liner can be used for drains.

Olle Karlsson looks at his foreign guests, who are of course very important, even if Sweden does answer for the greatest volumes. Global competition is cut-throat in this sector. “The only way to compete is to

work systematically to keep costs as low as possible. But we are probably already the most well-known global brand within UV hardening,” he says without blinking.

And the new investment in drain liners will make Inpipe almost all-embracing on the wastepipe and drainpipe market. All at the speed of light.