

IMPROFIL



Krah Pipes Manila's First Hydropower Project
in Mindanao

New Zealand solves plastic nightmare
Turning plastic milk bottles into underground pipes

Handbook For Large Plastic Pipes
Now available: Second edition

Content

1. Krah Pipes Manila's First Hydropower Project in Mindanao	3
2. New Zealand solves plastic nightmare - Turning plastic milk bottles into underground pipes	6
3. The goal of Varbla Fish Farm - Starting to produce caviar	8
4. A magical work on the shores of Nahuel Huapi Lake, Argentina	12
5. Desalination project on the Persian Gulf	14
6. Krah Mobile hole milling machine	15
7. Brand new Plastic Pipe Handbook - 600 pages of solid knowledge	16
8. Krah TV - Krah goes viral	17

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Krah Pipes GmbH & Co.KG
Betzdorfer Str. 8
57520 Schutzbach

www.krah.net

Dear Reader

Now I'm sitting here again, writing the intro for ImProfil 25 and half of the year is already over. You'd think Corona is making the year go by even faster than it usually does. After a long, strange period in which everything we usually took for granted was suddenly called into question, things finally seem to be going up again. This is also extremely important for the economy and the population, because this cannot be allowed to continue much longer. Lower incidence rates, further relaxation of the Corona rules and the possibility of finally being able to travel again are now giving people hope again and improving their mood. Even though there are still travel restrictions for many countries, our salespeople will probably be able to fly again in the next few weeks to maintain client relationships and build new contacts. This puts us in a positive mindset and we are slightly optimistic that things will now move further towards normality. There has also been a change at Krah. Our long-time employee Dipl.-Ing. Stephan Füllgrabe has left our company. For years, he represented Krah as a plastics engineer in the standardisation committees and supported developments/consultations for our worldwide customers. As managing director of the company Plaspitec, he also looked after our customers



and advised them on questions regarding the standardisation and certification of the pipes. We thank him for his constant good work and wish him all the best for the future. The company Plaspitec will now be continued by us. If you have any questions, please feel free to send an enquiry to info@krah.net or contact us by phone. To give our customers and interested parties a better insight into our company and our products, we have developed a new format - Krah TV. On our Youtube channel we will regularly upload videos explaining our machines and products. We also want to give insights into the companies that produce pipes with our technology and accompany them on construction sites where they are installed – read more on page 17. Also brand new is the publication of our revised handbook for large pipes. After completing the reports in it and adding many new ones, we can now proudly announce that it is ready for sale. You can buy the book in our online shop at www.krah.shop or on Amazon – read more on page 16. I hope you have all come through this difficult time well and can now start again with lots of strength and motivation! Stay healthy!

Alexander Krah

Krah Pipes Manila's First Hydropower Project in Mindanao

Project Brief

Hydro-electric power is the second largest renewable energy resource in the Philippines next to geothermal power. There is an ample number of hydropower plants spread out across the country of both conventional dam and run-of-the-river systems. The 14.5 MW Siguil Hydro power plant, a run-of-the-river system, of Alsons Power first renewable energy source venture that is expected to begin operations in 2022 – is to provide power to the rapidly growing cities of Mindanao, namely Sarangani, South Cotabato and General Santos City which is the home town of Senator and Filipino Pride Manny "Pacman" Pacquiao.

The construction is currently on full swing that commenced last 2019. They started with the plant's tunnel portal where water from the Siguil river basin in Maasim, Sarangani will pass through on a way to powering the facility's turbine and generator. This is also Mindanao's primary private sector power generator source. Moving forward, Alsons Power plans to develop at least seven more run-of-the-river hydropower facilities in different parts of Mindanao and Negros Occidental in Visayas.

Our scope

The 18km headrace pipeline of DN/ID 2000mm that links the collected water from the weir to the power house is



Staging area of DN/ID 2000mm pipes in Sitio Lunay

replaced by Krah structured wall pipes from the original design of glass-fiber reinforced pipes. This is a decision derived by the proponent and its EPC contractor, Sta. Clara International Corp., to ensure the timely delivery of the project next year, 2022. With the physical characteristics of Krah pipes like its workability, durability, and easy weldability on site, the hurdle

of laying it along the steep terrains of the mountain has been eased off. Another advantage that Krah pipes offered is our ability to customize the wall design of the pipes according to the actual project requirement of the head race pipeline. We categorized the pipes in 3 types according to the depth of embedment that ranges from 4m to 15m. A portion of the pipeline



will also be passing along concrete bridges of about 2km. The electrofusion jointing process also contributes in the timeliness of the project with our current jointing rate of average 36 linear meter per day. The integrity of each joints is guaranteed with the help of our hardworking skilled jointers and the pneumatic control test



Laying of Krah pipes over sand bedding

that is performed every after joint. The tightness of joints is vital for this application and a good hydraulic capacity without compromising the integrity of joints. Another advantage that we offer over other pipe material candidates in the project, namely GRP and ductile iron pipes. Krah pipes are non-corrosive yet flexible that give a very good vantage point over the aforementioned pipe materials.

This is our first hydro power project that also paved way to more opportunities to similar projects in Luzon and Mindanao. The power sector is now favoring the surmounting advantages of the use of Krah pipes for this kind of application. Another headrace pipeline project in

North Luzon of diameters 2.4m to 3.5m diameters in Benguet. This was originally designed to be reinforced concrete box culvert that was planned to be completed in 3 years is innovating to use Krah pipes that will shorten the duration in more than half – benefiting both proponent and end users. More so, Krah pipes is proving to be a sustainable and a value-engineered solution to further advancements of infrastructure in the country.

Author

Jeneleen Lansangan
Krah Pipes Manila, Inc.



On-going electrofusion jointing of Krah pipes

Pipe dream could help solve plastic milk bottle

An Auckland business plans to bury millions of plastic milk bottles, but not as landfill. That's where it gets interesting. They're going to turn them into underground pipes first.

Over the past year Solo Plastics has been testing technology to make plastic pipes out of recycled milk bottles. Those trials have been so successful that it has invested in new high-tech equipment from Germany that can produce pipes on a massive scale. CEO Alan Sutcliffe is confident the plant will be up and running in a new East Tamaki factory by the middle of this year.

Solo Plastics has been in business for more than 35 years, designing, building and installing plastic piping solutions for infrastructure in New Zealand. The business changed hands two years ago and developed a vision for „fabricating for a better tomorrow“. Alan says that means working “to protect our people and our planet by applying truly sustainable manufacturing“. The business has always recycled its own high density polyethylene (HDPE) offcuts and waste and collects HDPE waste from some of the sites it works on. It has also started a product stewardship trial collecting waste HDPE piping from electrical merchants. Last year Solo Plastics recycled 71.3 tonnes of plastic waste. That may sound like a lot but it's only a fraction of the amount used in production every year. “New Zealand imports thousands of tonnes

of HDPE resin from all over the world to make pipes while at the same time we're exporting waste plastic milk bottles abroad for recycling. We're trying to flip that on its head by importing less and using more locally,” says Alan. It turns out that our plastic milk bottles - the ones with the #2 recycling symbol – are a large and valuable and local resource.

“We've found the quality of milk bottles in New Zealand is extremely good, and we're getting really good results with it.”

A WasteMINZ report released in January reveals that more than 7,800 tonnes of #2 dairy containers, including milk bottles, are collected for recycling every year in New Zealand. Sadly, more than 1,700 tonnes are still being sent directly to landfill. At this point it's hard to estimate how many recycled milk bottles Solo Plastics will be able to use, but it's going to add up to millions over the next few years. To give you an idea, it takes more than 3000 two-litre milk bottles to make a standard six-metre length of pipe with a diameter of 800mm. At that rate, says Alan, getting enough bottles could be an issue.

“We're also doing trials using a mix of milk bottles and other HDPE plastics like shampoo and detergent bottles and the results we're getting are encouraging” This NZ based processing and market development of recycled materials provides further local product stewardship options for suppliers of packaged goods

to economically manage the end of life of their packaging. The bottles are processed by Astron, in Auckland, which turns them into tiny pellets of plastic resin. The resin can be used in a number of ways, including extrusion and injection moulding. Solo Plastics uses a method called 'spiral wound' extrusion. Rather than producing products made out of solid plastic, this latest technology uses lightweight spiral wound hollow cores around an inner core. This creates a product that's incredibly strong without being heavy. That's a big plus when you're producing pipes, up to five metres in diameter, as it makes them easier to handle, transport and install.

“They can be built to withstand the same loading and will last as long as concrete, which used to be the only option but is not a very sustainable product.”

Alan says recent studies have compared the emissions created when producing large diameter pipes using concrete and HDPE. “It was found that, on average, concrete produced 21% more emissions during production and 95% more emissions when transported from the factory to work site.” The new equipment on the way from Germany will make pipes out of virgin or recycled HDPE. Premium grade pipes for big infrastructure projects will continue to be made out of virgin resources. Pipes that don't need the same high level of structural integrity, as used on farms on forestry for culverts and waste water, can be made out of recycled

nightmare

material. Alan says that in terms of a circular economy the milk bottle project is a beautiful fit.

“We’re recycling milk bottles so they can be used to drain the farms that produced the milk in the first place. And, in a 100 years’ time those pipes can be dug up and recycled all over again.”

Listing for product stewardship directory

Solo uses recycled high density polyethylene (HDPE) waste to make pipes for a range of industries. It recycles HDPE waste and offcuts from its own operations, construction sites and some electrical

merchants. It has successfully trialed technology that uses recycled plastic milk bottles. New equipment coming online in mid 2021 will increase its use of recycled HDPE.

Author:
Solo Plastics



The goal of Varbla Fish Farm - Starting to produce caviar

Since 2014, sturgeon farming has been operating in Estonia (Paatsalu, Varbla municipality, Pärnu County), and the owners want to produce caviar in addition to meat fish in the coming years.

„We want to become the largest caviar producer in the region, but it requires additional money and hard work,“ says Kristo Teder, who has been on the board of Varbla Fish Farming Private Limited Company from the beginning. According to Teder, the idea to establish a fish farm in Paatsalu came from fish businessman Arvin Peks in the first years of this decade, motivated by the experience of growing exotic fish of Latvian origin Jevgenijs Mjasiševs. At the same time, the southern neighbor, which had grown up in Russia, America and France, set up sturgeon farming in Uruguay, and although the local owners had no experience in fish farming, it was decided to take risks. Today, Miyashev has left the project because his long absence in Uruguay did not allow him to contribute enough to the company, but in the initial phase his skills and knowledge were of considerable help.

A six-hectare property was found in Varbla Parish, where the constructions of the old Paatsalu cattle barn buildings could be used nicely in the construction of the farm. Water samples also showed that groundwater from limestone soils is ideal for sturgeon farming. According to Teder, the construction work started in 2013, the

financiers are the owners, Nordea Bank and the Rural Development Foundation, ARIB received about 450,000 euros in support from the aquaculture support EFF measure.

In March 2014, the first block of the farm was launched and the first egg was incubated. At the beginning of 2015, the farm was quite finished. Sturgeon, which is considered to be a royal fish, is farmed here in closed reusable aquaculture systems, groundwater is obtained from a borehole at a depth of 140 meters, and the total volume of water in the systems is 1,400 cubic meters. „We have four systems: an incubator, a juvenile fish system and two commercial fish systems. Technologically, the farm as a whole is working quite well, but the technical systems can certainly be improved to reduce energy and oxygen consumption. Technology is evolving rapidly and changes need to be kept up,“ says Teder. „We buy fertilized sturgeon from abroad and incubate the fry in our incubator. Then they go to the monkey house and are raised to a weight of a few tens of grams. From there, the fish already moves to the commercial fish ponds, where the final product is completed. “ Russian and Siberian sturgeon are currently grown in Varbla. In addition to sturgeons, other fish can be farmed here. „We have done a small experiment with perch for the Swiss market, but now our main goal is to focus on caviar production. If we find additional funding, we will only be a few

years away from the target. We want to involve a strong investor with whom to take the project forward. A few hundred thousand euros are needed, “Teder makes no secret.

To date, about 80 tonnes of fish have been released from here. „We market three-quarters of the goods in Estonia, the rest goes to foreign markets, mainly to Norway and Great Britain. At the moment, our sales are not large, because we keep the potential of female fish for the production of caviar. The world's leading sturgeon farmers specialize in the production and marketing of caviar. The demand for caviar is very high and the price of one kilogram of top quality reaches thousands of euros. At the same time, reaching the finished product is a long process and production costs must be covered during the whole cycle - fish feed, oxygen, electricity, labor. The current owners lack the capital to reach the desired end product. The nature of the fish farming sector also requires different loan products than those offered by Estonian commercial banks, “Teder opens the current state of the company. Thus, Varbla understands that sturgeons do not only make a profit from meat production. At the same time, according to Kristo Teder, there is every opportunity for the economic indicators of Varbla Fish Farming to reach a plus. „In general, our goals have been met. We hope to make a profit next year. If we succeed in producing caviar, we will be able to meet our financial obligations in four to five years. On the

DN/ID3000 VW16 tank with a cone bottom out of 30mm PE plate



basis of the existing fish stock, we could produce caviar already in 2018 and we would be able to produce about two tons every year. We are thoroughly prepared. As the only Estonian company, we have CITES accreditation for the production, processing and packaging of caviar. " In parallel with the production of caviar, the production of fish meat in Varbla will be maintained, although the volume will be smaller: sorted male fish will be sold as meat fish in kilograms or more.

When it comes to fish meat, Varbla Fish Farming Private Limited Company has reason to be proud. „We have reached a very high quality fish meat. We have supplied fish to the teams of top Estonian and Norwegian chefs, for example, who

competed successfully in the Bocuse d'Or competition this year. Our fish has been on the table during the heads of state's visits to Kadriorg Castle and has even been sent to the Michelin-starred Pied à Terre restaurant in London. " However, there is no point in investing in fish meat alone. Compared to the time of the company's establishment, the market situation has changed radically. „The situation is not favorable for us - the traditional Russian market has disappeared".

(Source: Postimees/Maaelu by Toomas Šalda)

Fish farming company - Jaesto OÜ - is operating a closed recirculated

aquaculture system (RAS). Aquaculture system where there are always at least two cultures that need to be taken care of. One culture is the fish species that is farmed and the second is the bio filter culture – symbiosis to balance. Bio filtration in clear water aquaculture farms can be done via different technical methods like with fluid-bed, fixed bed and with combined bio filter media. All of these methods have different benefits. Mainly the systems are consuming NH₃/NH₄, which is dropped into water as fish feces or fish feed waste, CO₂ that comes from breathing and digesting of wastes in bio filters. Firstly, the RAS is cleaned with mechanical filtration or with water flow sedative as physical help. This stage



removes bigger particles. Second stage is bio filtration with different mid-stages to take care of water chemistry. The black HDPE containers are set-up to clean the Aquatic environment so that successfully cleaned water is reusable again. The material is good because it is durable and easy to modify if needed. This is how the circulating aquaculture system can save cost efficiently the water resource that fish and other aquatic organisms can grow with a small footprint on the surrounding environment. Krah Pipes OÜ got the request for 10 ID3000 H=5000 tanks in December 2020. At first it was a simple task: ID3000 VW16 tank with a bottom out of 30mm PE plate. As we got more involved with the project and the more we

talked with the client, it became clear that it will not be a project that we thought it was going to be. In the end it was a tank with cone bottom with pipes going through under the bottom. It took ca 8-9 days for 2 men complete one tank. Most challenging tasks were bending and butt-welding the cone bottoms. Also reinforcing the cone bottom with different diameter VW pipes (ID600 VW28; ID1200 VW28; ID1800 VW30 and ID2400 VW30) First tank was ready to be shipped out in the beginning of March 2021. Last tank was shipped out on 26.04.2021. The client was really happy with the end result although the beginning was rough. The client was really time sensible as they had 5 tons of small fish waiting to

be delivered and there was a chance that if the construction was delayed the fish might not make it. In the end everything worked out well and the fish are ready to move into their new home.

Author

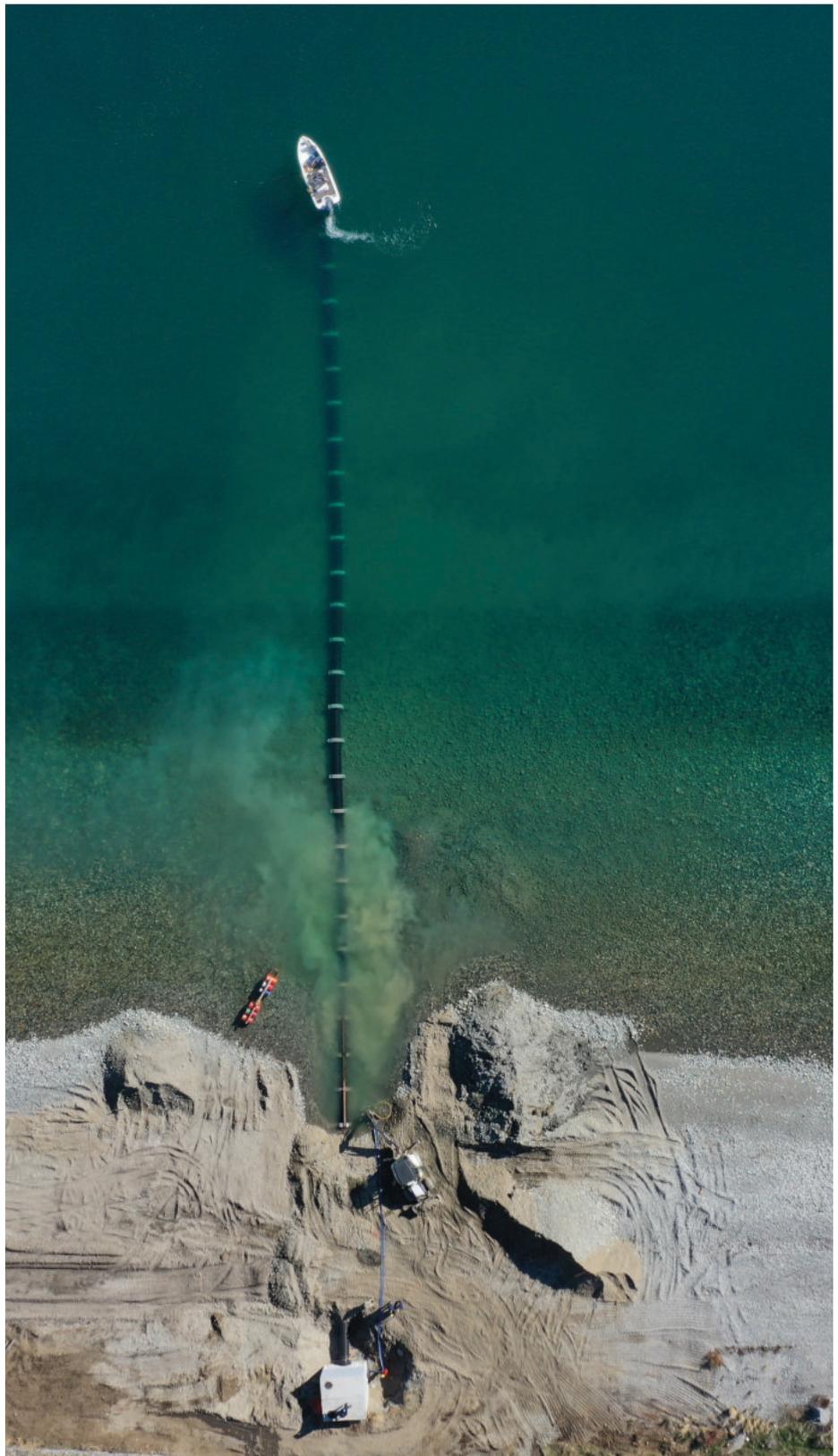
Oliver Tuus
Krah Pipes OÜ, Estonia



A magical work on the shores of Nahuel Huapi

The National Entity of Water Works for Sanitation, proceed with the expansion works of the Treatment Plant and its respective Collector of San Carlos de Bariloche, in Rio Negro province in Southern Argentina.

The work on the Treatment Plant is close to completion, which consists of expanding capacity by the construction of a new module and the incorporation of a currently non-existing grease removal unit, with these new facilities the plant will fulfill the treatment requirements of an ever growing city maintaining the Nahuel huapi lake water cristal clear. The submarine outfall is 80 meters length and has a diameter of 0.8 meters. The pipes were joint by the unique Krah electrofusion system. A Little more about Nahuel Huapi lake... It's located within the Nahuel Huapi National Park, has a surface of 530 km², rests 2,510 feet (770 m) above the sea level. The lake depression consists of several glacial valleys carved out along faults and Miocene valleys that were later dammed by moraines. Its seven branches are named Blest , Huemul, de la Tristeza, Campanario, Machete, del Rincón and Última Esperanza. It is connected to other smaller lakes such as Gutiérrez, Moreno, Espejo and Correntoso. The deep-blue waters hold a number of islands, most notably Isla Victoria with an area of 31 km², and Isla Huemul. In the rivers, lakes and streams we can find a number of various fish species including the natives: perca, puyen and the Patagonian pejerrey; and



Lake, Argentina

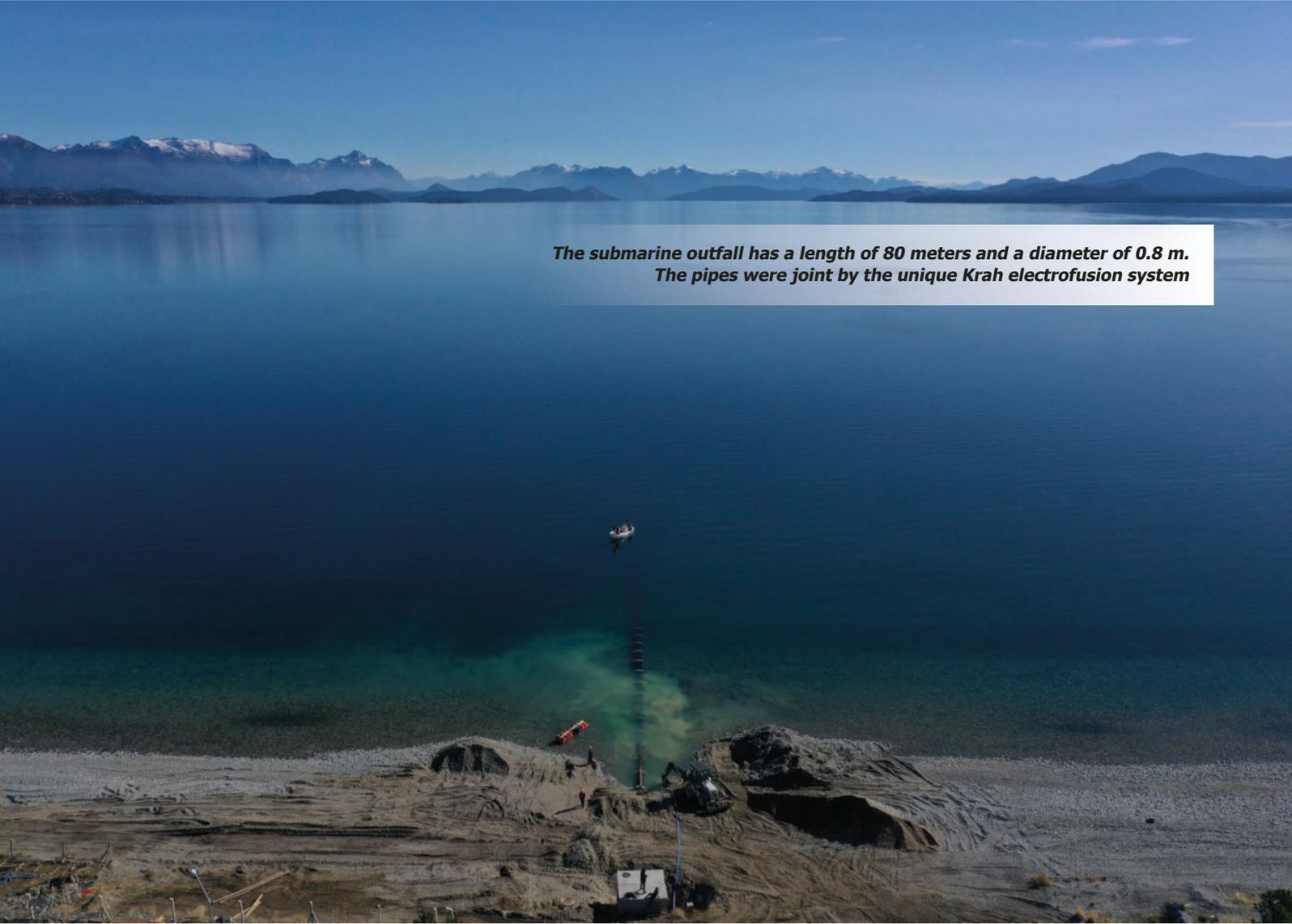
some introduced species such as rainbow trout, brown and brook trout and salmon. In the Andean-Patagonian forest, we can find a large number of native tree species such as: Coihue, Maiten and Radal; and, in more marshy areas: Arrayan and Patagua. If you are lucky enough, maybe you can see some autochthonous mammals such as the Pudú-Pudú or midget deer, the Hhuemul (deer), the Puma and the Huillín or river otter, the Red Fox, the Zorrilla, the

midget weasel etc., these are scarce and can rarely be seen. Amongst the exotic fauna we have the Red Deer, and herds of Guanacos that can be watched on the slopes of Valle Encantado. The avifauna is represented by the Cormorant, Cauquen, Bandurria, Gull, the Woodpecker, the Great Bustard, etc. The large common Grebe or Huala, the Bandurria, the Bustard and the gullible Chucao, can be easily spotted. You can also listen to the sad whistle of the Fio-

Fio. The birds of prey are abundant on the steppe; and the best known, the majestic Condor, is on high summits. Who had not tremble at watching the magnificence of its flight...?

Author

Sabrina Rocio Fernández
Krah América Latina



***The submarine outfall has a length of 80 meters and a diameter of 0.8 m.
The pipes were joint by the unique Krah electrofusion system***

Desalination project on the Persian Gulf

The SAKO desalination plant is located on the Northern coast of the Persian Gulf, Bandar Abbas, which consists of desalination units with a total product capacity of 1.000.000 m³/day, i.e. 42.000 m³/hr from seawater, using "Reverse Osmosis" technology. A sea water intake system supported by HDPE pipes and related accessories (ID 2500mm), was supplied from Tadbir Novin Sazan company (TNS Co.). The total length of the project were 16km, divided in 6 pipelines for intake and 3 pipelines for outfall applications. The sea water intake facility is based on a gravity filled pump basin which supplies the required water for desalination plants. The site of the project is located on the Persian Gulf seashore in Homozgan Province of IRAN.

Regarding the warm and dry climate of Central and Southeastern Iran, and at the same time, the necessity of further development of the Iranian Mining Industries that require massive water resources located in these regions and considering water shortage in the country, were the main reason to construct such a project.

The main water consumers of the project are "Potable and industrial applications of the Hormozgan province", "Gole-Gohar Iron Ore Company", "Sarcheshmeh Copper Industrial Company", and "Chador Malu Mining and Industrial Company". Supplying potable and industrial water which is required to construction of large

industrial, mining and steel companies, contribute to industrial growth and also promoting economic prosperity especially in the provinces (Hormozgan, Kerman and

Yazd) with less water, are some important advantages of this plan.

Author:

TNS (Tadbir Novin Sazan)



Krah presents: Mobile hole milling machine

When installing sewer systems, holes must often be milled in the pipes in order to be able to insert inlets and outlets.

This is a demanding task, because the radius must first be drawn in and then cut out precisely so that the inlets and outlets can be inserted accurately and absolute tightness can be guaranteed. For larger holes, we offer the Manhole Fabrication Center (MF 200), which can mill holes from 90 to 2500mm. The Krah Group has now additionally developed a mobile hole milling machine that can mill hole diameters from 150 to 500mm continuously. This hole cutter can be used for solid wall pipes as well as for profiled pipes. For solid wall pipes, a minimum wall thickness of 10mm is required. The maximum wall thickness

or profile height, in which the holes can be made, is 140mm. The hole miller can be used on pipes with a diameter of DN/ID600mm to DN/ID3000mm. It is suitable for both fabrication and construction site use, as it is mobile and easy to handle due to its light weight. Another advantage is that it eliminates the need to mark out the diameter, so mistakes can no longer happen, as this is a very precise and demanding job. The result is an exact, circular cut-out that no longer requires any finishing work. Since the hole is machined completely from the outside, this work step can also be carried out on a pipeline that already is in operation. This means that there are no delays in the work process and pipes can continue to be laid and connected at the same time. The

fast processing also contributes to this - to produce a hole diameter of 500mm, for example, only 4 minutes are needed.

A set consists of:

- Clamping and centring device
- Extensions for clamping device
- Crown drill
- Variably adjustable milling carriage
- Milling cutter
- Transport case

For further information please contact info@krah.net

Author:

Jenny & Jochen, Krah Group



Brand new Plastic Pipe Handbook

600 pages of solid knowledge

We are proud to say that the second, revised version of our Technical Handbook is now available. It now contains more than 30 new articles, together with the most valued and informative articles from the first edition.

The book has now 600 pages, full of qualified plastic pipe knowledge. We are proud to present so many new comprehensive, technical and commercial articles.

The year 2020 has obviously been a very hard one for everyone, not just on the emotional and personal side, but also on the business side. Since there will probably be no exhibitions this year as well, we want you to use this book as a reference tool for the Krah pipe technology. Whether you are a customer or are interested in our technology, this book contains a collection of different very interesting projects that have been realized with the Krah technology, such as marine applications, sewage and drainage projects, pressure pipes, industrial pipe applications and many more. Of course the new edition again provides also general information about plastic materials, pipe testing, jointing technologies and design of pipes.

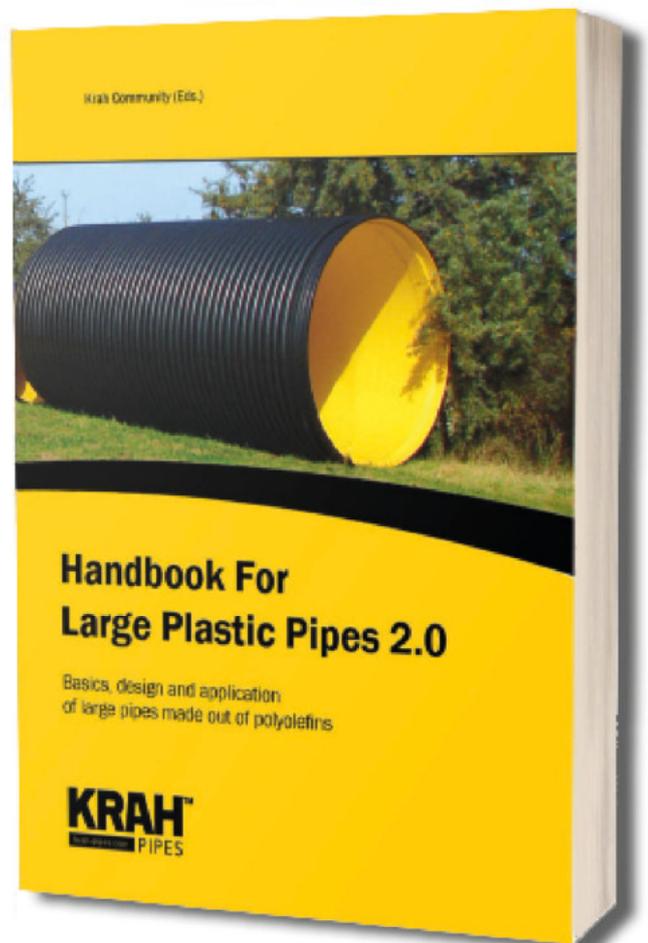
Despite the current climate crisis and people's wish to live more sustainable, you have to make a difference between 'single-use-plastic' like straws, packaging or bags and long-lasting, recyclable products like our pipes, which have a lifetime of up to

100 years and can then be recycled if required.

The international Krah Community with all its members and followers gives its best every day to polish up the image of long-life plastic and is very successful with it. A big thank you goes to everyone who was involved in creating this book. More structured, technically updated and still application-oriented - this is how we would describe our handbook. Our aim is to present a book that is interesting for everyone who is in touch with large diameter plastic pipes.

Clients, constructors and consultants of large pipe projects can get plenty information about the products and a guideline to calculate and specify a sustainable pipe system. It is now available on Amazon or in our own Krah shop, where you will get a little discount.. See you there!

PS: If you haven't already visited our Krah Web Shop, make sure to check out the discounts and offers we have over there, you can order anything from Krah Notepad over Welding wire , E-Box's to Welding Rod Production Machines.



Krah TV - Krah goes viral



In the past year, the focus on digital communication has increased a lot. Meetings are solely carried out via Zoom or Microsoft Teams, Webinars are held instead of real live trainings, even the usual friday night out at the local pub is transferred to an online meeting. Even if it might not be the same as in real life, it still is a great way of explaining technology, presenting new inventions or keeping contact with customers. That's why we have decided to rework our youtube

Channel "Krah" and open a new format: Krah TV.

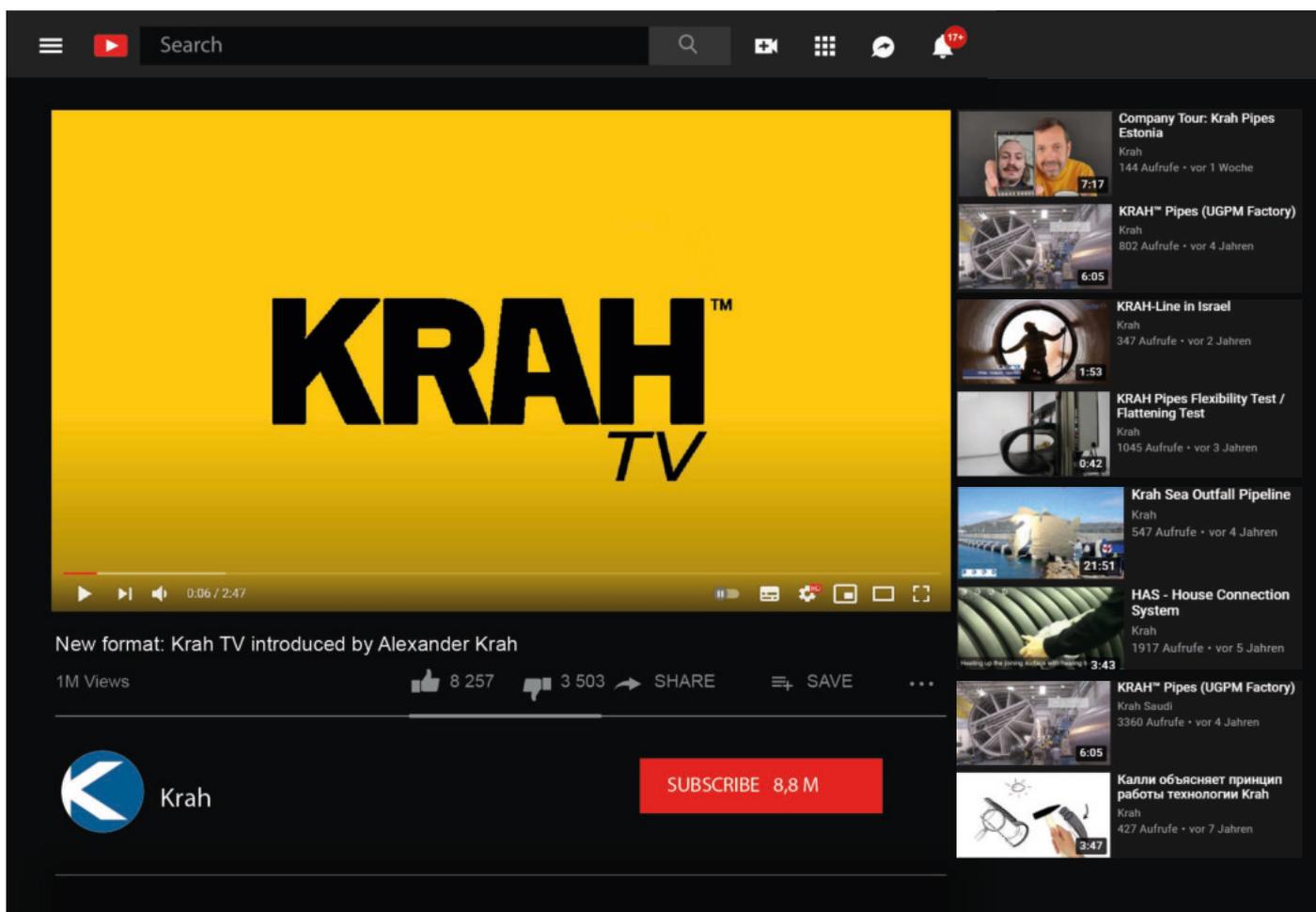


We will make various playlists, ranging from product presentations, travel diaries (our sales staff reporting live from construction sites, when possible again), explaining different technologies like electrofusion, the usage of hand welding

extruders and much more. You can find our channel by simply searching YouTube for "Krah".

We have already uploaded 2 new videos by the time this magazine gets published, 1 being a company tour from a Krah Community member. It's an interesting sequence of Krah machines actually producing Krah pipes, seeing how the machines are running all over the world.

Lisa, Krah Group



Should you be interested in featuring a Company Tour, please contact us: l.blaecker@krah.net

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