



Federal Ministry  
for Economic Affairs  
and Energy



MITTELSTAND  
**GLOBAL**  
FOREIGN MARKET  
ENTRY PROGRAMME



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# Circular Water Economy in the Mining Sector in South Africa

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Digital Fact-finding mission for German delegates.  
5-9. July 2021



German Water  
Partnership



Deutsche Industrie- und Handels-  
kammer für das südliche Afrika  
Southern African-German Chamber  
of Commerce and Industry



# Background

The Southern African-German Chamber of Commerce and Industry (NPC) (AHK Southern Africa) is implementing a digital fact-finding mission for German companies on the topic of circular water economy in the mining sector in South Africa. The fact-finding mission will take place digitally from 5.-9. July 2021. The project forms part of the German Federal Ministry for Economic Affairs and Energy (BMWi) Export Initiative for Environmental Technology and is carried out as part of the BMWi market development program for small and medium-sized German companies (“Markterschließungsprogramm”).

The fact-finding mission is organised in cooperation with the German Water Partnership e.V. and is supported by the VDMA. German companies can gain an insight into the target market by means of an exciting five-day programme involving an internal briefing, a conference and several reference plant visits.

Within the scope of this delegation, South African interested and affected industry, research institutions and government departments will attend the conference on water management in the mining sector on 6 July 2021. This conference will focus on private sector involvement and on exploring business opportunities between South African and German businesses, institutions and sector experts. During this conference, German companies have the opportunity to present their products and services. In the days following the conference, a meaningful exchange between the South African and German water sector will be facilitated through scheduled, individual B2B meetings.

The following German companies will be partaking in the fact-finding mission:

- Sensatec GmbH
- Engineering Dobersek GmbH
- ifm electronic GmbH
- FELUWA Pumpen GmbH
- Boreal Light GmbH
- WILO SE
- PPU Umwelttechnik GmbH
- MANN+HUMMEL Water & Fluid Solutions GmbH (recently rebranded from Microdyn-Nadir GmbH)
- Hydac International GmbH
- VEGA Grieshaber KG
- EnviroChemie GmbH
- Cerafiltec Germany GmbH
- J&C Bachmann GmbH



The project forms part of the German Federal Ministry for Economic Affairs and Energy (BMWi) Export Initiative for Environmental Technology and is carried out as part of the BMWi market development program for small and medium-sized German companies (“Markterschließungsprogramm”).

# Implementation agency



Deutsche Industrie- und Handelskammer für das südliche Afrika  
Southern African-German Chamber of Commerce and Industry

## Southern African – German Chamber of Commerce and Industry NPC

The Southern African - German Chamber of Commerce and Industry NPC (AHK Southern Africa) is part of the worldwide network of German Chambers of Commerce Abroad with 140 locations in 92 countries. It was founded in 1952 and since then has supported around 600 member companies in their international business as an important platform for bilateral economic collaboration and exchange.

The AHK Southern Africa is a central player in Germany's bilateral economic relations with Southern Africa on behalf of the Federal Republic of Germany. It represents German business interests at their locations and provides information about and promote Germany as a business location. Under the service brand "DEinternational", the AHK Southern Africa offers companies from Germany and the host countries services to support their business activities.

The AHK Southern Africa has dedicated Competence Centres for core economic sectors, including water management, relevant to the Southern African region. In addition, a regional coordinator is responsible for the coordination of the activities in the region, as well as the establishment and growth of relevant networks.

AHK Southern Africa's services entail:

- Market analysis and provision of market information
- Supporting companies in market entry and market expansion (business partner search, delegations, etc.)
- Activities geared towards market development
- (Sector) representation, network and cooperation platform

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# Cooperation Partner



## German Water Partnership e.V. (GWP)

The German Water Partnership e.V. (GWP) is a network of around 350 private and public companies from the water sector, as well as trade associations and institutions from business, science and research. Since its foundation in 2008, the initiative has been supported by the five Federal Ministries for the Environment, Research, Development, Economics and the Federal Foreign Office.

The GWP bundles the activities, information and innovations of the German water sector in order to strengthen its competitive position on international markets. The network improves the framework conditions for business field development abroad, drives innovation and contributes to solving water management problems worldwide with adapted, integrated and sustainable approaches.

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# Supporting Partner



## VDMA Mining

The German Engineering Federation (VDMA) represents more than 3,300 member companies in the SME-dominated mechanical and systems engineering industry in Germany and Europe. VDMA is divided into cross-sector departments and has representative offices in Berlin and Brussels as well as liaison offices in important foreign markets. 38 trade associations and various working groups, as well as international committees and forums of VDMA, deal with the branches of the mechanical engineering sector. In total, approximately 600 VDMA employees worldwide work for the members.

VDMA Mining represents 145 manufacturers of equipment for open pit and underground mining as well as for coal and mineral processing/ beneficiation and consulting/ engineering companies.

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# The German water sector

The management of natural resources, especially water resources, has a long tradition in Germany. The growing world population and the constant increase in agricultural and industrial production clearly require a sustainable and resource-saving use of water.

## **The efficiency of the German water industry**

The German water industry is shaped by long-term experience in this sector. Drinking water of excellent quality and sufficient quantities is available to German citizens. Despite being a water-rich country Germany has a number of voluntary water management measures that contribute to the protection of natural resources.

Wastewater treatment is also at a very high level in Germany. In contrast to many EU countries, almost 100 percent of the wastewater is treated according to the highest EU effluent discharge standards. Drinking water suppliers and wastewater disposal companies thus make a significant contribution to prevent or to minimise the pollution of water sources.

Essential performance indicators of water supply and wastewater disposal in Germany are long-term security of supply and disposal, high drinking water quality, high wastewater disposal standards, high customer satisfaction and careful use of water resources with economic efficiency.

## **Water supply and sewage disposal: responsibility of local municipalities**

Local municipalities are responsible for water supply and wastewater disposal in Germany. Municipalities are free to choose the appropriate organisational structures and type of water and wastewater treatment technology. Its democratically legitimised bodies take the strategic decisions on forms of organisation, participation, and cooperation. Germany's water supply and wastewater disposal sector constitutes of privately owned and public facilities. The specific regional and local political, environmental, and economic conditions provide the framework for water provision and wastewater disposal, resulting in locally relevant solutions.

In order to remain current and resilient in future, water management must be efficient, financially stable and transparent. A holistic, integrated and sustainable approach to water management is critical as societies are experiencing the consequences of climate change and urbanisation. Challenges for the water sector are diverse. A transition to sustainable energy sources is necessary and treatment facilities must be able to stand up against extreme weather events. Wastewater treatment must be improved to significantly reduce harmful trace metals and other harmful compounds.

Urban aquatic ecosystems and water resources must be better protected to make urban societies more resilient to climate change. Germany have a plethora of small to medium sized businesses who are competing to find solutions to the wide variety of challenges of effective water management.

The German water sector is highly specialized with innovative, flexible and value-oriented companies and institutions along the entire value chain. German entrepreneurs, engineers, developers and researchers are used to working in multidisciplinary consortia and always strive to provide lasting solutions to local challenges.

## **Data and facts about Germany's water sector**

- Serves 83 million people
- 188 billion cubic meters of fresh water are available every year, but only 10-15 % (25 billion cubic meters) is used
- 127 litres are consumed per person per day
- 550,000 km of sewer network (97% degree of connection to the sewer network)
- 10,500 sewage treatment plants
- 530,000 km of potable water network (100% connection to the drinking water network)



## Sensatec GmbH

Sensatec is an international technology provider for the investigation and in situ remediation of industrial and mining sites, sophisticated drilling technologies, as well as the application of sensor-based environmental monitoring systems. Project references for more than 600 sites investigated and 400 successfully remediated sites throughout Europe make Sensatec one of the leading expert contractors in the field of environmental restoration.

One of the major strength is the interdisciplinary nature of the Sensatec team, which consists of geologists, hydrogeologists, process and biotech-engineers, electrical and environmental engineers as well as technicians. The team operates globally by making use of mobile investigation tools, mobile lab facilities and treatment units.

At present, Sensatec is conducting investigations and remediation activities at approx. 100 industrial and mining sites. We have teamed up with the most renowned research institutes in Central Europe (UFZ Leipzig, Austrian Institute of Technology, Vienna; TZW Karlsruhe) to develop more capable and innovative technologies for environmental restoration purposes.

In the Mining sector we focus strongly on the elimination of arsenic, heavy metals and sulphates e.g. from acid mine drainage and groundwater. On the African continent, there are current activities in Namibia (As-elimination) and Tanzania (sulphate-elimination) by applying innovative and very cost-efficient in situ treatment technologies together with our exclusive partner AquaMatters (Pty) Ltd. based in Pretoria, South Africa.

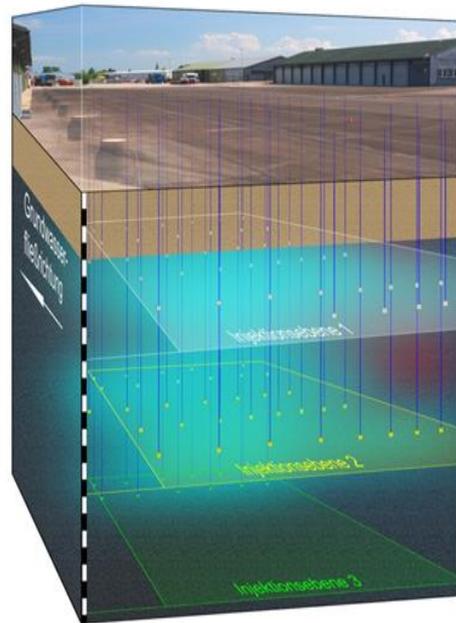


Figure 1: Schematic of an “invisible” in situ treatment of a contaminated aquifer

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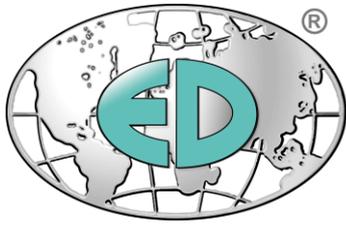
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# ENGINEERING DOBERSEK®

## Engineering Dobersek GmbH

Engineering Dobersek GmbH is a German based and an internationally active mineral processing company, specialised in supplying turnkey plants on EPC contract basis (Engineering Procurement Construction) for the treatment of a variety of ores. Moreover, the company specialises in planning, construction and commissioning of plants and plant components in the fields of power and environmental engineering, mining and metallurgy, water treatment, as well as chemical and special plant engineering. We are a medium-sized EPC company with more than 180 employees at the head office in Germany, and almost 200 employees worldwide.

We are an independent engineering company and our clients appreciate and expect from us independence concerning component manufacturers and technologies. Our plants are tailor made, state of the art German quality and take into account the specific requirements of the client. Preferably, we use components from reputable European manufacturers.

Engineering Dobersek delivers turnkey plants, including all necessary systems in order to provide the client with a fully functional plant on EPC or EPC-similar contract basis. Engineering Dobersek GmbH provides additional consulting, engineering and construction work, which may be required for the implementation of a solution.

We achieve implementation of a solution via a local subcontractor, who completes the civil, steel and installation project components. However, Engineering Dobersek retains responsibility over the quality of the product itself and the installation process. Our objective in South Africa is to get in contact with the possible clients and to lay the foundation for future cooperation.

Keywords: minerals processing, ecology industry and water industry.

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## ifm electronic GmbH

Since 1969 ifm has manufactured solutions for the automation world. From inductive sensors to condition based maintenance, ifm helps you to walk towards Mining 4.0 with innovative, high quality and state-of-the-art products prepared for tomorrow. ifm designs position sensors, process sensors, vibration monitors, industrial networks and safety devices solving challenging applications such as cooling towers, hydraulic power units, pumping -/ generator stations or conveyors for raw material and mobile controllers.

Together with smart sensor solutions (IO-Link), the SmartObserver (IoT software solution) from ifm offers you a practical solution to evaluate production indicators in order to improve product quality, machine uptime and the overall process performance to make your mine more efficient.

After many years of intensive cooperation with our customers we have established ourselves in the market as service-oriented sensor specialists and today we are represented by more than 7,300 employees in over 95 countries worldwide. Even though we have grown into a big company we have still maintained the virtues of the founding years: The flexibility and individuality of a small enterprise and the quality and professionalism of a group. Our customers in 185 countries are still today in the centre of our work. We bring you to the future of automation, always in close contact, always close to you.

Keywords: mining, industry 4.0, mining 4.0, machine tool manufacturing industry, food and beverages, automobile industry.

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## FELUWA Pumpen GmbH

FELUWA pumps are hermetically sealed and are an excellent solution for the transporting abrasive, aggressive and toxic fluids. In times where the focus on environmental aspects is more important than ever before, a safe pumping technology is indispensable. Additionally, water is a very valuable good and the awareness around the need to save water is increasing in most industries.

Thanks to their unique design, FELUWA MULTSAFE® pumps help to reduce water consumption in the mining sector. FELUWA MULTSAFE® pumps are designed to handle highly heterogeneous mixtures with high solids content, which means that less water is required. Slurries, concentrates, tailings and also aggressive chemicals and wastewater can be handled safely and reliably.

All over the world, FELUWA pumps are being trusted in for the most demanding applications such as (underground) mine dewatering, tailings and concentrate transport, autoclave and filterpress feeding, backfill operations and many more.

Thanks to its' unique design, the MULTISAFE® double hose-diaphragm pump offers highest safety, availability, and reliability. The high-quality pumps made in Germany allow for individual pumping solutions for high pressure applications up to 350 bar.

Being an international player, FELUWA has also successfully supplied pumps to South Africa for the production of synthetic fuels in order to reduce carbon emission, as well as other smaller applications. With our already established local service partner Rota-Eng Consulting (Pty) Ltd., we are ready to assist customers with competence, know-how and reactivity. Even for the most demanding pumping applications – FELUWA has the right solution.

Keywords: mining, wastewater, water-management, high pressure pumps

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WaterKiosk

## Boreal Light GmbH

Boreal Light GmbH is a young Berlin based company specialized on renewable energy solution for water treatment facilities. The company designs and manufactures affordable solar water desalination systems for off-grid communities around the globe. Systems manufactured by Boreal Light are capable of delivering high quality hygiene drinking, irrigation, fish farm and sanitation water from any kind of high saline and polluted water resources. Applications of the technology in the mining sector include preparing water for human consumption, irrigation (reuse) or the cleaning of contaminated downstream water.

Powered fully by solar, simplicity of the design and affordability of the cost of the systems manufactured by Boreal Light are the three great competences the company is proud of. Winture® and WaterKiosk® are the two registered trademarks for systems and services offered by Boreal Light GmbH.

For the implementation of water treatment projects in South Africa and the rest of the African continent, Boreal Light GmbH has partnered up with the South African company BE AfriBusiness (Pty) Ltd.

Keywords: off-grid, solar-powered water treatment, desalination, water reuse.

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## Wilo SE

The Wilo Group is one of the world's leading premium suppliers of pumps and pump systems for building services, water management and industry, including the mining sector. We have been active in South Africa in the form of Wilo Pumps SA (Pty) Ltd. since 2001. With over 40 employees, the location acts as a platform for the overall African market in accordance with our "region-for-region" approach.

In industrial process technology, Wilo offers a wide portfolio of high quality and process-optimised industrial pumps that guarantee trouble-free operation. The fields of application for our pumps and pump systems are cooling water circulation systems, heating circuits, raw water intake, water supply, firefighting, water treatment, and sewage disposal. In the mining industry, our systems convey important raw materials securely and reliably. Especially in the industry the focus is, of course, on a long service life and the robustness of the pumps used. The control units, valves and pipes are adapted according to specific requirements in order to optimise the pump system for the respective industry.

Climate protection has been in our DNA ever since the company was founded. For years, the Wilo Group has been pursuing the Sustainable Development Goals (SDGs). That is why we are proud to be one of 50 Sustainability & Climate Leaders. An initiative supported by the United Nations.

Mining industries of the future need green energy in all areas of operations. Wilo pumps can achieve significant energy savings and integrate with technologies required for carbon free mining. Importantly, Wilo pumps can be used for production, storage, distribution and use of hydrogen. As the energy carrier of the future, hydrogen has huge potential in Africa.

In the last 10 years, Wilo has significantly expanded its commitment in Africa and is now represented in over 20 African countries with subsidiaries and so-called pioneers.

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## PPU Umwelttechnik GmbH

ClearFox® is the name of the brand for the products of PPU Umwelttechnik GmbH. PPU is situated in Bayreuth, a city in the German province of Bavaria and is a manufacturer of standard and tailor-made wastewater treatment plants. The ClearFox® range of products and solutions covers the full spectrum of wastewater treatment, from industrial, to municipal and domestic. We specialise in modular containerised systems that are factory tested and basically plug&play with minimal on site work. This saves time and costs during installation and allows for the system to be moved should this be required. We build robust systems to treat all kinds of wastewater no matter the contamination or volume. The Clearfox range of products have been successfully installed in many countries all over the globe, during the past 25 years.

Mr. Gunter Martelock's area of responsibility is the management and development of the PPU/ClearFox® network of international sales partners in Sub Saharan Africa.

- Large scale EPC projects
- Containerised wastewater treatment solutions (industrial, commercial, workers camps)
- Industrial wastewater treatment
- Technology licenses
- Domestic / municipal sewage systems [electric and non-electric]

Contact Mr. Gunter Martelock for further information or to discuss a specific project.

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# MANN+HUMMEL Water & Fluid Solutions GmbH

MANN+HUMMEL Water & Fluid Solutions is a leading membrane manufacturer with a vision to solve the world's water and fluid challenges so that together we can create a safe, sustainable, and healthy planet. They offer a comprehensive spectrum of membrane filtration and separation solutions over a complete range of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis products.

Membrane technology continues to advance year after year and MANN+HUMMEL Water & Fluid Solutions is proud to be one of the industry's leaders. For more than 50 years, MANN+HUMMEL Water & Fluid Solutions has been producing high-quality membrane products for use in industries across the globe.

With facilities in Europe, Asia, and North America, MANN+HUMMEL Water & Fluid Solutions has the products, passion, and expertise to meet all your membrane and filtration needs.

MANN+HUMMEL Water & Fluid Solutions is a division of MANN+HUMMEL, a €4 billion filtration company based in Germany with thousands of customers across the globe. For more information, visit [www.microdyn-nadir.com](http://www.microdyn-nadir.com)

The Mann+Hummel membrane modules find a wide use in the Mining&Refinery industry for solid/liquid and liquid/liquid separation. These technologies not only get used for the water and other utilities liquids, but also upstream in the process environment.

Application examples:

- Electrolyte purification/recovery
- Acid purification/recovery
- Metal salts purification and concentration
- Dam water recycling (i.e. by extracting soluble metals and minerals from the water)
- Recovery of ultra-fine suspended base and precious metals from process streams
- Cleaning of baths and rinsers

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## HYDAC International

HYDAC is one of the leading global suppliers of components, systems and services in the areas of hydraulics, lubrication, fluid care/filtration, cooling, electronics and condition monitoring. For more than 50 years, the company has been supplying solutions into a wide variety of industrial sectors and applications such as mining, power generation, mobile machines, steel and cement plants, oil and gas, general industry and others. Today, HYDAC has close to 10.000 employees worldwide.

In South Africa, HYDAC Technology (Pty) Ltd offers the full HYDAC range of products and services into South Africa, the Southern African Development Community (SADC) and Kenya. Via sales offices in Johannesburg, Cape Town, Durban and Port Elizabeth as well as a strong network of distribution partners, HYDAC is a leading provider of fluid power solutions to customers on the African continent.

One of HYDAC's core competencies is the filtration and treatment of fluids. HYDAC supplies solutions for water filtration such as automatic back-flushing filters and fine filters down to 1µm as well as filter skids for freshwater, wastewater and process water treatment. Our filters can be found in different applications such as mining, power plants, irrigation, fresh water supply, industrial processes, cooling water treatment, sewage plants and others.

Key words: hydraulics and lubrication, fluid engineering, water filtration, cooling solutions, Condition Monitoring

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## VEGA Grieshaber KG

VEGA Grieshaber KG is a world leader in the field of level, switching and pressure measurement. The company employs more than 1,800 people worldwide, 840 of them at the headquarters in Schiltach / Germany. Here, solutions for demanding measurement tasks have been developed for almost 60 years. VEGA is active in over 80 countries with a global network of subsidiaries and sales partners. The company supplies measurement technology for level, switching and pressure - perfectly adapted to the requirements of the water and wastewater, chemical and pharmaceutical or even food industries. All the necessary certificates and approvals for worldwide use are of course available. This applies to both the technical safety and the quality of the products and services.

VEGA South Africa employs over 40 people. Important industries are the food, pharmaceutical, water and wastewater industries, as well as mining. These industries offer growth opportunities, especially in the mining sector.

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## EnviroChemie GmbH

EnviroChemie is a leading plant engineering company that specialises in the design, construction and operation of industrial water and wastewater treatment, water circulation and water reuse. These include energy and resource-efficient solutions for water treatment, water recycling, the treatment of process water, cooling water, wastewater treatment and resource recovery.

We develop the technologies and water treatment chemicals for the physico-chemical, biological and membrane treatment of water and wastewater in our own process engineering laboratory and technology centre. EnviroChemie regularly acts as a partner in national and international research projects for the development of forward-looking technologies.

In terms of plant operation, we offer comprehensive services, including operation management, supply of water treatment chemicals, operation management and contracting.

For over 45 years, EnviroChemie has been delivering water technology that is "Made in Germany" throughout the world, supporting customers with their responsible use of resources. EnviroChemie is a member of the EnviroWater Group, a network of companies with around 850 employees working on solutions with a broad range of requirements for sustainable water treatment.

### EnviroChemie cleans up mine wastewater

In some cases ecologically harmful wastewater from mines contains valuable residual metals that could offer economic benefits if recovered. We offer classic, centralised treatment plants, as well as modular decentralised plant systems for:

- Metal, non-metal, coal and inorganic materials mines (e.g. copper, lead, zinc, gold, coal and uranium)
- Phosphate fertiliser producers; and
- Hydrometallurgical facilities.

These use a wide range of treatment methods, including oxidation, flotation, filtration, ion exchange methods for separation, and ore dressing of copper with subsequent extraction by precipitation or electrolysis; direct precipitation to hydroxide, sulphide or cementation; and membrane technologies, including combinations of ultrafiltration, nanofiltration and reverse osmosis.

Products and services: water and wastewater treatment, water reuse and recycling, energy from wastewater, zero liquid discharge, modular plants, operation & maintenance, contracting, digitalisation.

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## Cerafiltec Germany GmbH

CERAFILTEC® is a Germany based water technology company with satellite office in South Africa. CERAFILTEC® provides ceramic flat sheet membrane technology solutions including process know-how and engineering. The membrane systems of micro- and ultrafiltration like those provided by CERAFILTEC® substitute typical sand filters, sedimentation tanks, and polymeric micro- and ultrafiltration solutions for particle and pathogen removal from water. They further allow for higher recover rate, smaller footprint, lower power consumption, superior removal of taste, colour and odor, simple operation, and advanced automation.

The core business of CERAFILTEC® is to provide solutions for (1) the treatment of potable water from various sources like groundwater, surface water or seawater (2) the treatment of sewage effluent (TSE) and (3) the treatment of industrial water such as mining water.

The membrane system is suitable for the removal of particles of any kind, bacteria and germs, iron, manganese or other heavy metals and even dissolved contaminants. CERAFILTEC® technology can treat water containing oil (FOG), high TSS, fluctuating feed water and various other industrial wastewater, showing a strong advantage for challenging media including high temperatures and low/high pH.

Founded in 2016 by the team that invented and pioneered the ceramic flat membrane technology, CERAFILTEC® has realised more than 75 projects in 28 countries, including plants with a capacity to treat 200,000 m<sup>3</sup>/d or more. CERAFILTEC® has agencies all over the world. In South Africa, CERAFILTEC® is represented by Cerafiltec South Africa (Pty) Ltd.

Keywords: potable water, wastewater, ultrafiltration (ceramic membranes)

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## J&C Bachmann GmbH

### Technology & Solutions. We make you see what you do not see

X-Ray Fluorescence Online Element Analyzers  
 Borehole XRF Probes  
 Image Analysis  
 Microwave Moisture Measurement

J&C Bachmann delivers technology and solutions for process control and quality monitoring in demanding industries. Typical applications are in mining, recycling, environmental and automotive manufacturing industries. The J&C Bachmann in-house team of scientists, engineers, software developers and project managers building on over 20 years of experience provides unique core competencies with:

- The development of solutions to include the application of physical methods and customized software.
- Designing and manufacturing systems and equipment for online elemental analysis
- Qualifying and validate performance in our test center and lab. Systems and solutions from one hand: from concepts to commissioning
- Maintenance services: from remote monitoring to local site support and training.

Key technologies applied are:

- X-Ray fluorescence elemental analysis
- Microwave moisture measurement
- Near-infrared measurement and spectrometry.

Key equipment and products are:

- XRF online analysers for bulk material
- XRF online analysers for fluids and slurries, also with multiplexer
- Moisture measurement instruments.

Key applications for exploration, process control and recycling requirements are in:

- Coal
- Minerals
- Metals
- Plastics
- Water and wastewater treatment

J&C Bachmann GmbH is in the process to establish an own entity in South Africa, please contact Frank Hurst for any question.

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