

Pörrner **ANLAGENBAU 4.0** supports the process industry, striving to create more flexible, cost effective and safer production.



We Create Productivity



In almost every industrial plant the product quality and capacity can be improved and energy and fuels reduced by process optimization, replacement of components and advanced automation systems.

Such continuous improvements are necessary if producers want to remain competitive as operators of industrial plants, and be active members of the increasingly dynamic global market.

Change as opportunity

Political crises, economic sanctions, the unexpected slump in oil prices as well as the sharp fall in the value of many a currency have led to the volatility of raw materials, intermediates and end products.

At first glance, these circumstances mean higher risks for European industries, but the lower energy and commodity prices also open up new opportunities.

Increasing the competitiveness

The requirements on modern plant operation are manifold: rapid adaptation through flexible production and the exploitation of all technical and organizational potentials to be able to generate high-quality products in a fast and efficient manner.

These dynamics lead to an increasing demand for ultramodern process plants whether new or retrofitted. Both require high-quality engineering services.

Anlagenbau 4.0

Making the investment of all these components more effective and safer, not only increases efficiency, but also limits the environmental impact and is thus crucial for sustainable business growth and success.

In almost every industrial plant it is possible to enhance the product

quality and capacity through process improvements. In this light Pörrner pursues a holistic approach under the motto "Anlagenbau 4.0" with a view to provide process and industrial plants in all areas (process, equipment, systems, instrumentation, monitoring and analysis) with the latest integrated technological solutions to achieve the most flexible, cost-effective and safe production.

The Pörrner Mission

It is our mission to assist our customers in implementing their projects right from the initial idea. This includes the pre-engineering study designing and budgeting of the project through to the management and coordination, basic and detail engineering, procurement of equipment, the construction and installation as well as the successful commissioning of the completed project from a single source- to

help the customer establish an overall high competitiveness in a constantly changing global market.

Our teams of generalists as well as specialists develop, together with the plant owner new plants or extensive reconstruction projects of existing units. More than 500 engineers from all disciplines are available to tackle these challenges enthusiastically. We thank our many industrial clients who have entrusted us with their most important projects and we will continue to do our utmost to keep this trust, no matter the size of the project, from smaller studies all the way to major investments.

We are constantly aware of the high responsibility placed on us to design, through creative ideas and sound knowledge, successful engineering projects for our customers. We intend to continue this theme of "Anlagenbau 4.0" over the coming decades and strive for new productivity. ■

www.porner.at/anlagenbau4_0

ACHEMA 2015

Dear ACHEMA visitors

The Pörrner Group is pleased to welcome you to the most important trade fair for the process industry. Once again, we have set up our "Engineers' Café" at the fair. Here you can relax and escape from the hustle and bustle of the fair and talk with our engineers about new projects in a Vienna coffeehouse atmosphere.

Aside from international newspapers on offer, you will find our very own publication, "Engineering Times". Here you can read about how the Pörrner Group has developed in the last few years, new technologies and plants we have completed as well as what we plan for the future.

We wish our customers and partners a successful event!

**YOU WILL FIND US AT
STAND D23 IN HALL 9.1**



WORLD WIDE WEB

BY DOMINIK MIMRA

Bitumen Bag website with new content

To accommodate the growing number of inquiries and further development of the Pörner Bitumen Packing System the most essential information on the website has been re-edited.

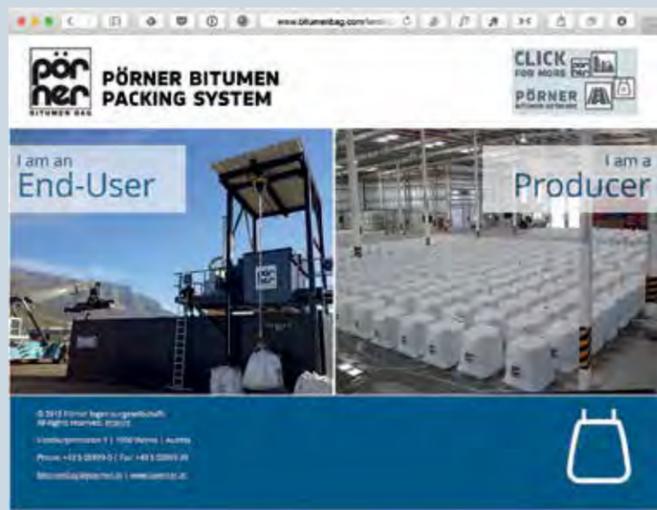
The Pörner Bitumen Packing System is interesting for two groups – those producing bitumen, i.e. refineries in particular, and those using the bitumen, i.e. the end-user.

To this end the existing website www.bitumenbag.com was restructured into two areas, one for producers and one for the end-users.

The „Landing Page“ directs interested parties to the relevant information they need. For producers the existing content

is presented in greater detail, whereas the area for the end-user has been redesigned. The visitor is thus provided with comprehensive information in a step by step fashion on the principle of Pörner Bitumen Packing System, its elements (Pörner Bitumen Bag™, High Performance Melter) and benefits.

The Frequently Asked Questions section gives answers concerning major aspects of the system. Subsequently, detailed inquiries concerning delivery can be made online. For this purpose, a central coordinating body was established in Vienna available at bitumenbag@poerner.at to deal with inquiries quickly and efficiently. ■



<http://www.bitumenbag.com>

WWW.BITUMENBAG.COM



MOSCOW. In February 2015, the Pörner representative office in Moscow was officially opened.

The opening was attended by representatives of the largest oil companies in Russia, such as Lukoil, Rosneft and Gazprom Neft, senior managers from Metafrax and representatives of the Austrian Chamber of Commerce and the Department of Foreign Economic Relations of the Moscow city administration.

Dmitry Sergejevich Starov, a process engineer with profound knowledge of the Russian oil and refining industry, is head of the representative office.

Albert Traxler, head of international sales at Pörner Vienna, armed with extensive experience in industrial large-scale plants in Russia, Azerbaijan and Turkmenistan, joins forces with Gerhard Bacher, the CEO of Pörner Grimma as well as Lutz

New Managing Director at EDL

Management. Mr. Michael Haid has been appointed spokesman of the management of EDL Anlagenbau Gesellschaft mbH.



Wolfgang Kursch (EDL) and Group managing director Peter Schlossnikel extend a warm welcome to Michael Haid.

LEIPZIG. Since April 2015 Michael Haid has been directing the affairs of EDL Anlagenbau Gesellschaft in Leipzig together with Mr. Wolfgang Kursch, who has been member of the board of EDL for several years.

Mr. Haid acts as spokesman of the management and is in charge of international sales, whereas Mr. Kursch is responsible for sales activities in Germany.

Professional Background

After his study of process engineering at the University of Karlsruhe (TH) and the Auckland University, New Zealand, Mr. Haid began his professional career as a process engineer for Edeleanu GmbH Alzenau - the former parent company of EDL.

For almost twenty years now, he has been in the engineering

business gaining profound experience in engineering, sales and management in Europe, Russia / CIS, Middle East, Asia and America. He filled the positions of the head of process onshore downstream, technology management director for Technip Germany as well as managing director of TGE Gas Engineering.

In his previous role Mr. Haid was managing director of ZAO TOMS Engineering in Russia and responsible for the development of the business segment of Gas & LNG (liquefied natural gas) in Russia / CIS. We wish Michael Haid every success in his new position.

Mr. Haid is married and father of three children. ■

New Pörner representative office in Moscow

Expansion. Official opening of the Pörner representative office in Moscow in the presence of members of Russian oil companies and the Austrian Federal Economic Chamber



Peter Schlossnikel, Albert Traxler and Gerhard Bacher at the opening ceremony of the representative office, next to the Austrian Trade Attaché in Moscow, Dr. Fellner, and colleagues of the Foreign Trade Center Moscow as well as representatives of renowned Russian companies.

Hoffmann, head of international sales at EDL Leipzig to coordinate sales and projects of the Pörner Group in Russia and the CIS.

In his opening address,

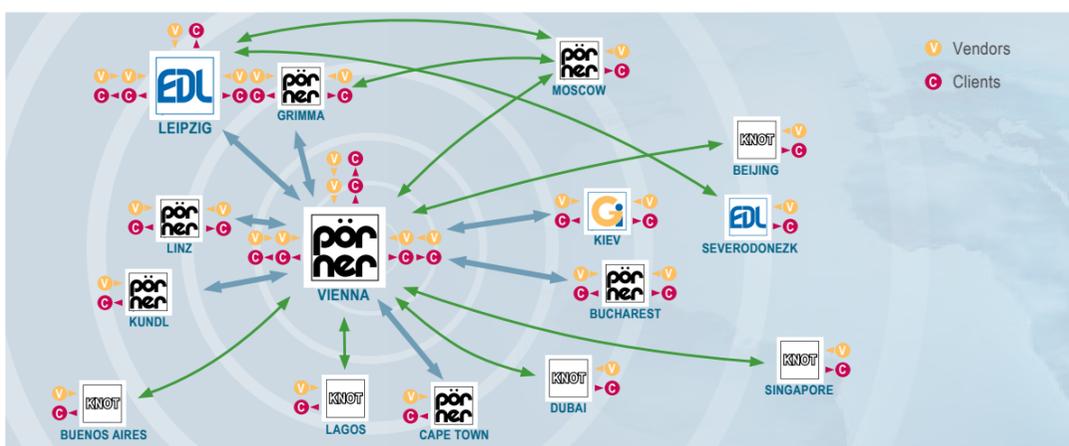
Group managing director Peter Schlossnikel emphasized the exceptionally successful and long-standing business relations of the Pörner Group and companies in

Russia and the CIS. He reiterated that Pörner will continue to engage in business on the Russian market despite the current difficult economic and political situation in the region.

Especially in times of low oil prices, the Russian industry needs top of the range technologies as well as qualified engineering services for the planning and construction of highly efficient process plants.

The new office in Moscow is the ideal platform for exchanges and project negotiations with customers in the petrochemical and chemical industries of Russia and CIS. A highly qualified and motivated team is available as an initial contact for the client.

Our colleagues at the new Moscow office can be contacted at: moscow@poerner.at. ■



The representative office in Moscow is another step towards extending the Pörner network of engineering expertise and sets the course for even more intensive market activities and support of our customers in Russia and the CIS.

The Secret of Success

Interview. Talking with Peter Schlossnikel reveals the secret of the international success of the Pörner Group.

Ed.: Mr. Schlossnikel how is the Pörner Group structured and how has it grown?

P.S.: The Pörner company was founded 43 years ago by the brother of my partner, Kurt Thomas Pörner, as a one-man office, which now has about 500 employees. With K. Th. Pörner's exit in 1996, a management buy-out was carried out. Since then, Andreas Pörner and I are the main owners of the company.

The Structure: The Company began focusing only on piping but at the beginning of the 80s, additional disciplines and departments were established, such as civil and steel construction, process, electrical, equipment and mechanical engineering to be able to offer complete systems from a single source, back then still a novelty. In the following years, offices in Austria, Germany, Romania and Ukraine were established, and in 2003 EDL in Leipzig and in 2006 Gazintek in Kiev were integrated into the company. In February 2015 we opened the representative office in Moscow.

Although all of these locations function independently, the skills and work capacity of all the individual sites are utilized synergistically across projects. This is an asset for all involved.

Ed.: What kind of projects do you use these synergies for?

P.S.: The Pörner Group is well established in Central Europe, since there is hardly any comparable company here. We serve as a service partner for the local businesses, in particular Austria for customers such as OMV, Borealis, Voestalpine, Agrana and the like.

On the other hand we also partner and work with large companies

Peter Schlossnikel is managing partner of the Pörner Group



in the international arena.

Ed.: In which countries are your main markets?

P.S.: It is different every year. In Austria, we operate say, in an exclusive location as there are hardly any comparable companies in this market.

One focus are of course our Biturox® plants. There are already more than 40 of these around the world and there are more every year. Lately the engineering for several installations in the Gulf region and the Middle East have been completed and more projects are being planned. These are quite new for us and therefore are all the more exciting, we see great opportunities for the future in these markets.

In recent years, there has also been an increased number of inquiries from the petrochemical and chemical industry.

Ed.: How is the group's turnover divided between Austria and the other markets?

P.S.: This is different every year. Basically, the turnover of the Pörner Group is always a mixture of engineering services as well as other supplies.

The engineering sales roughly equate to the number of employees. The scope of supply, however, is changeable, depending on which supply contract fall into the current fiscal year.

Ed.: Which business sectors have been particularly developing

lately?

P.S.: The general trend, both in Europe and in Russia, is the modernization and upgrading of existing facilities. Such contract packages, projects worth between 20 and 100 million euros fit the size and capacity of our services very well.

Ed.: To what extent has the enlargement of the European Union or the increasing globalization contributed to your success? How does Pörner equip itself for the challenges ahead?

P.S.: In my opinion, the European Union has helped us tremendously, by the abolition of borders, the greater cohesion and a common position on the world market. Every state in Europe on its own would not have had the opportunities we now have as a common Europe.

As one of the largest engineering firms in Austria and now a respected Central European firm, it is important to preserve our flexibility by adapting and responding quickly to the market changes.

We are very optimistic and convinced that the future belongs to the engineers!

Ed.: Thank you for the interview ■

EDITOR'S LETTER

BY ANDREAS PÖRNER

Economy never stands still

The global world is short-lived and everything is subject to constant change. Customer's needs are changing rapidly, products and goods are becoming more diverse and specialized. It is the job of the plant engineering and construction sector to come up with new ideas based on established principles and using the latest tools ("Anlagenbau 4.0", see article on p. 16).



with the knowledge and expertise of our specialists.

New structures and systems

Human interaction has always been important in the Pörner Group. A relationship on the basis of trust with the customer and within the company is the basis of success. Clear structures are to facilitate rather than hamper activities. Therefore we avoid useless bureaucracy. To make sure this happens, our task force teams are configured according to the size and the technical demands of each

How has the process plant market changed?

In recent years the volume of investment in large-scale processing plants has declined in Europe whereas the demand for smaller chemical plants focusing on the production of specialty or niche products, is increasing globally. Companies cannot but constantly improve their production lines in terms of quality, capacity, energy saving.



Pörner employees commissioning a Biturox® plant in Russia

For the engineering tasks required for this purpose, there are only a few general contractors in the German speaking region. And this is where the Pörner Group comes in to fill this gap, by engaging in projects with high technical requirements (e.g. melamine plant of 300 bar pressure and 300 °C) as well as small modernization projects worth more than € 100 million.

Project development AND implementation

Projects have to be implemented quickly first of all. It requires professional project organization and appropriate planning capacities in all disciplines. Pörner has vast experience in global procurement of plant equipment.

It is also important to note that: The livelier and more dynamic the communication and collaboration of all those involved, the better the result. Pörner acts as a catalyst to implement the customers' ideas

and every project.

This approach puts us in the position to execute projects whether small for industry and trade or large-scale as general contractor with investment volumes of over € 100 million in an efficient and cost-effective manner.

The future: implementing technology optimally

With the environment always in mind Pörner is committed to technological progress and ready to take on new entrepreneurial challenges, big or small. This is why we have developed the new guiding principle „Anlagenbau 4.0“.

This company bears my name and therefore it all the more adds to my motivation to make further progress and achieve a healthy growth of the group.

I am convinced that there is still a lot of potential within the Pörner Group, to come up with new ideas and technologies for the benefit of our customers and the company. ■

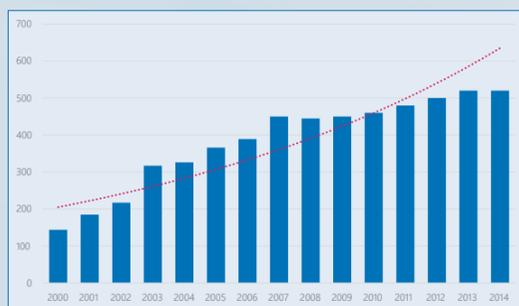
PÖRNER GROUP IN NUMBERS

Turnover increased tenfold

Within 25 years the turnover of the Group has increased tenfold. The trend of positive sales illustrates the increasing project volumes the Pörner Group was entrusted with and is a result of the high performance of the Pörner engineers.

This healthy growth is based on the low fluctuation of labour and thus the balance between „old hands“ and young „fresh“ talents. Pörner's total capacity today is around 650,000 man hours per year.

Technological know-how and the expertise gained from more than 2,000 executed projects in over 40 years are the profound foundation of our competence and assure the „certain extra“ in productivity, innovation and flexibility that customers appreciate so much. ■



Manpower development 2000-2014



Turnover growth 2000-2014 [mill. €]

STEP BY STEP HEADING

Pörner designs and implements industrial projects

It takes many steps and the cooperation of several departments, to ensure that a project succeeds.

Pörner offers all engineering services for the construction of modern automated and highly productive process plants: these all

from a single source – from a single mold.

As a process-oriented plant engineering company, the Pörner Group supports customers right from the very concept all the way to the turnkey completion of every phase of the project. Each project

is tailored to the specific customer requirements.

We offer integrated engineering services, ranging from process development, basic and detail engineering and procurement to construction supervision and commissioning.

Every Pörner office has a complete organizational structure with all disciplines to execute plant engineering and construction projects.

Teams are put together depending on the requirements of the individual project to meet the

specific needs of the client.

The customer has only one contact for complete solution and coordination, the Pörner project manager.

For more information visit: <http://www.poerner.at/services.html>

Project management

Ing. Christian Birgfellner




The control center

The project management works as a control center for each project. It is the point of convergence of all activities where decisions are made and implemented and work coordinated.

The project manager is responsible for an efficient execution of the project in keeping with the contract.

THE PERSON

Christian Birgfellner has been working for Pörner as a mechanical engineer since 1997, mainly as a project manager for plant revamps. Since 2014 he has been in charge of the coordination of the Pörner Austria projects and is the contact for all project managers and specialist departments.

Process engineering

Dipl. Ing. Jana Foltyn




Always present

Technology plays a central role in the process plant engineering and is in operation from project initiation to commissioning. Starting with pilot tests, plant concepts and processes are defined with the help of process simulations. On this basis, the process engineering design of all system components, flow diagrams and P & ID diagrams are drawn up. In addition, the process engineering department is responsible for internal research and development of own processes.

THE PERSON

Jana Foltyn studied process engineering at the Slovak Technical University in Bratislava. Since 1994, she has been working for Pörner as a process engineer and has been the head of the process engineering department in Vienna for the last 15 years.

Electrical & Automation

Dipl. Ing. Reinhard Kropshofer




Electrifying

The group of engineers focuses on three priorities: electrical, instrumentation and automation. This is done in various ways for the implementation of process control systems or the distribution of electrical energy, e.g. for industrial parks.

With the commercial interests in mind an optimal engineering concept is developed.

THE PERSON

Reinhard Kropshofer studied electrical engineering at the Technical University in Vienna. For 25 years he has been head of the E/I+C department of Pörner Vienna. During this time he has expanded the competence of his department steadily.

Piping

Ing. Thomas Hermann



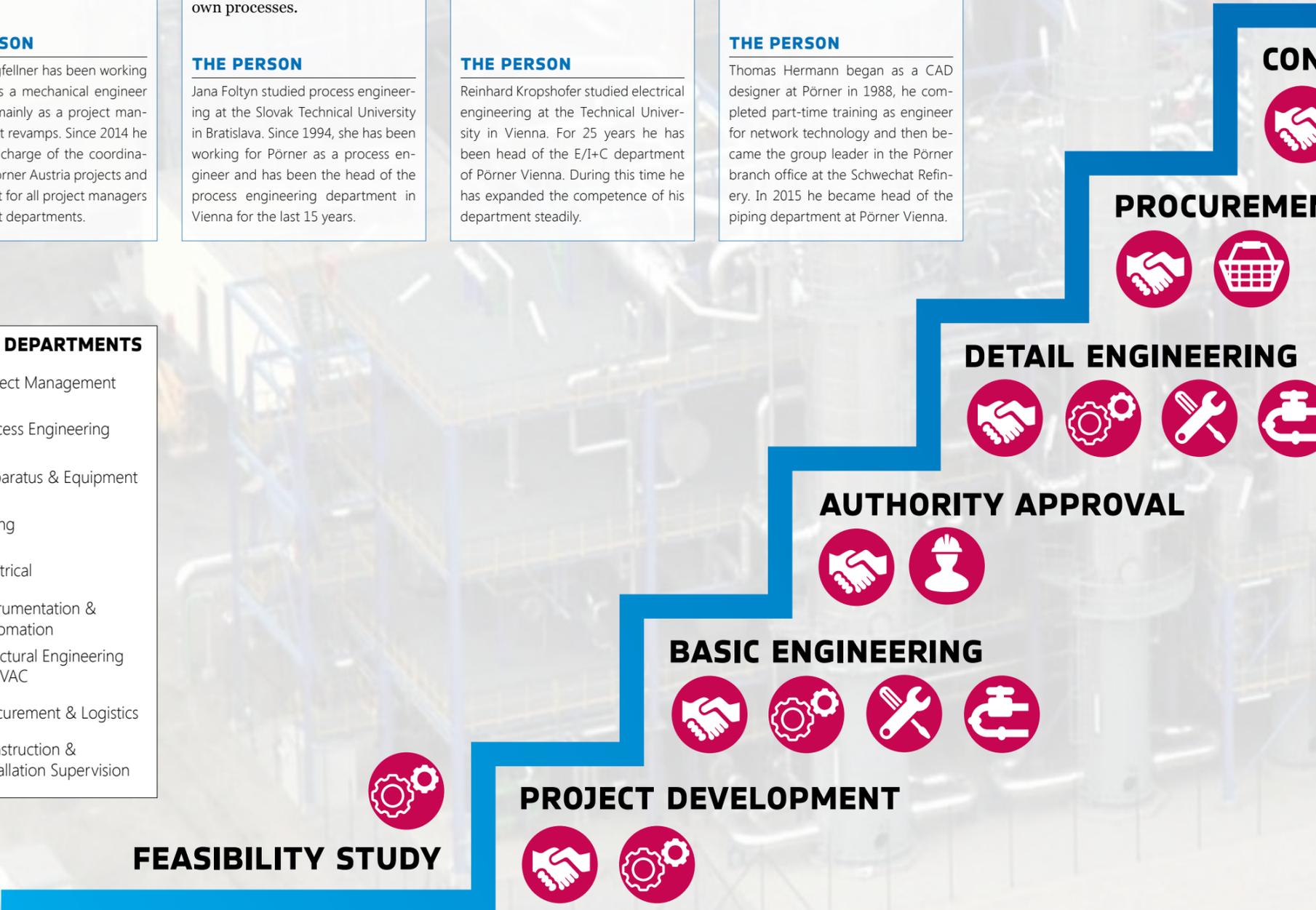

Making the works a reality

The experts in the piping department are in charge of construction planning, pipe stress analysis, pipe class preparation, material management as well as CAD and any necessary documentation. Teamwork is an important characteristic for a piper as interdepartmental cooperation is essential and must be interfaced with other trades. Smaller orders are handled independently.

THE PERSON

Thomas Hermann began as a CAD designer at Pörner in 1988, he completed part-time training as engineer for network technology and then became the group leader in the Pörner branch office at the Schwechat Refinery. In 2015 he became head of the piping department at Pörner Vienna.

- PÖRNER DEPARTMENTS**
-  Project Management
 -  Process Engineering
 -  Apparatus & Equipment
 -  Piping
 -  Electrical
 -  Instrumentation & Automation
 -  Structural Engineering & HVAC
 -  Procurement & Logistics
 -  Construction & Installation Supervision



TO A FINISHED PROJECT.

ects from a single source, efficiently and quickly.



Everything is on the table here! Project and department heads of Pörner Vienna meet regularly on Mondays to discuss the current projects.

AFTER-SALES SERVICE

COMMISSIONING AND START-UP



CONSTRUCTION MANAGEMENT



NT



ANLAGENBAU 4.0

we create productivity

Equipment

Ing. Christian Steurer



Everything blends together

The Viennese process equipment specialists plan and design all kinds of equipment, such as heat exchangers, firing, boiler and furnace systems for a project. Occasionally, also independent, medium-sized projects are handled.

THE PERSON

Christian Steurer has been on board since 1991 as mechanical engineer. In 2004 he became head of the process equipment department at Pörner Vienna.

Machinery

Dipl. Ing. Markus Schubert



Always on the move

The mechanical engineering department is in charge of motor-driven equipment and the design, request for quotation through to bid comparison. After contract award it supervises the manufacturing and production process and its specialists are on site when it comes to the installation and commissioning.

THE PERSON

Markus Schubert studied mechatronics at Fachhochschule in Wiener Neustadt and joined Pörner in 2005. In 2013 he took over as head of the mechanical engineering department at Pörner Vienna.

Civil, Structural & Architectural

Dipl. Ing. Thomas Olbrich



Integrated comprehensive planning

The CSA activities are integrated directly and completely into the overall planning process of a project. The understanding of the complexity of the plant in the planning, procurement and construction process is deeply rooted in the specialists of this field. Whether industrial projects or a museum: The project processes are almost identical.

THE PERSON

Thomas Olbrich studied civil engineering at the Vienna University of Technology and began his career as a civil engineer at Pörner + Partner Ziviltechniker GmbH. Since 2012 he has been head of the civil department in which the former Pörner + Partner has been absorbed. Olbrich is also a managing partner of Pörner ZT GmbH, founded in 2012.

Procurement & Logistics

Ing. Peter Mitterer



More than just buying

The department has two main functions: procurement and expediting.

Procurement covers all equipment, materials and services that are specified by the individual departments. This includes bid evaluation, negotiations and contract award to the best bidder.

The shipping expediting ensures that the equipment arrives safely and precisely at the final destination. For transport logistics good knowledge of the legal requirements is needed as well as unique knowledge of the cultural customs of the country of destination is of essence.

THE PERSON

Peter Mitterer joined Pörner in 1989 after his training as a mechanical engineer. At first he worked in the project operations department and since 1999 he has been head of Procurement & Logistics which he manages very successfully.

DEVELOPMENT

Silicate from rice husks

GRIMMA. Pörrner Grimma has teamed up with the licensor to develop a novel technology for the production of precipitated, amorphous silicates from rice husks, a residue of rice processing. Rice husks protect the sensitive rice grains against external influences during ripening. The enormous resistance of this ultra-thin material is based on silicates and cutins. This is why it can be used as first-class raw material for advanced high-duty accumulators. The porous nano-structure of this kind of silicon is ideal for use in anodes of high-capacity lithium-ion batteries.



It needs a special process to obtain silicon oxide from the valuable silicates that is used for the production of Green Tires in the electrical and electronics industry and in solar systems, too, in future.

A reference plant is located in the USA. ■

Biturox®
Pilot plant

SCHWECHAT. At research institutions the product quality is optimized by defining the right mixture of feedstock for the Biturox® plant on the basis of practical tests. In almost 40 years Pörrner has performed pilot tests with almost all kinds of crude, developed methods of how to formulate and process bitumen, collected feedback and performance reports from the Biturox® licensees and merged the results in a database. It is thus possible to define an efficient and economical production of high-quality bitumen even from unconventional source material. ■



Deasphalting and Dewaxing / Deoiling

Interview. EDL is extending its technology portfolio for better processing of residues and lubricating oil. Two test facilities are in operation.

LEIPZIG. For EDL, as a technology-oriented plant engineering company, research and development is the forefront of business. In a cooperative project with the Institut für Nichtklassische Chemie e.V. (INC) of the Leipzig University, two test facilities have been set up to study the deasphalting (SDA/PDA) technology at different temperatures and pressures using various solvents and quantities. It also enables the team to analyze the processes of solvent dewaxing and deoiling by using methyl ethyl ketone and toluene as solvents.

Ed.: Mr. Schwartz, you have been working in the EDL process department for 10 years. Why are



THE PERSON

Jan Schwartz studied at the University for Technics, Economics and Culture (HTWK) in Leipzig. Since 2003 he has been working as process engineer at the Pörrner Group, first at Pörrner Grimma and since 2007 at EDL in Leipzig. His core areas are SDA, Dewaxing / Deoiling.

test stands so important?

J.S.: EDL offers the process chain from SDA plants, solvent extraction through to the solvent dewaxing and deoiling processes for lube oils as proprietary technology. For the design of this process and the required process guarantees it is necessary to determine the conditions and composition of the solvents and the relevant process temperatures. And this is why we need a test lab.

Ed.: Why are simulation programs unsuitable?

J.S.: The amount of data currently available is not big enough and thus is of limited informative value only for a purely theoretical design by a simulation program.

Ed.: Isn't the solvent dewaxing/deoiling technology outdated already?

J.S.: Refineries increasingly turn to more advanced processing methods (catalytic cracking) where by-products, such as aromatic hydrocarbons and waxes, hardly play a role. This shortage of feedstock forces the paraffin producers to process the medium-heavy and heavy slack waxes. For this purpose, however, they need the good old technology. This is why paraffin producers have repeatedly contacted EDL in recent time.

Ed.: What kind of data can be gen-



Test facility for process analysis of deasphalting technology

erated at the test facility?

J.S.: This technology is optimized and improved at the test stands using alternative techniques. A case in point are the parameters which are defined for the customer specification (mass balances, process temperature, cooling rates for crystallization, optimal solvent conditions etc.).

Besides the mass balances of the entire process it is also possible to determine the specification of the core equipment for the solvent dewaxing or deoiling process.

Ed.: What are the benefits for the customer?

J.S.: EDL offers the entire

range of studies, basic and detail engineering through to commissioning. The customer gets a complete technological package of an optimized process and the relevant process guarantees.

From day one we give the customer advice and support, initially at the lab, then during the entire process of plant engineering and construction through to the completion of the project. The test facility is used to test new feedstock for its suitability and the customer can specifically look for raw materials on the market.

Ed.: Thank you for the interview. ■

EDL offering EU-conforming technology for tyre production

R & D. With a second step in solvent extraction EDL achieves the environmentally friendly production of extender oils (TDAE and TRAE).

BY ROLF GAMBERT

LEIPZIG. To produce high-quality lubricants, aromatics are extracted from vacuum distillates and deasphalted oil of the solvent deasphalting process applying the solvent extraction process. This by-product of lube oil production has been primarily used by the tyre industry as softener and extender oil.

EU decision

Due to the fact that polycyclic aromatic hydrocarbons (PAH) have been qualified as highly toxic substances (carcinogenic, mutagenic and reprotoxic) the amount of PAHs in softeners was limited by the EU Directive 2005/69/EC which had a major impact on tyre production: The extender oils used until then, such as distilled aromatic extract (DAE) and residue aromatic extract (RAE) are

explicitly prohibited and the share of PCA (all polycyclic aromatic hydrocarbons) in the extract has to be less than three percent.

The solution:
Extraction of extracts

To abide by the required limits, the

high PCA amounts of the extracts can be separated in an existing solvent extraction plant by employing a further extraction stage.

It is then possible to obtain Raffinate Treated Distilled Extracts (TDAE) and Treated Residue Extracts (TRAE) from the DAE and RAE extracts. The novel

extender oils are environmentally friendly mixtures of substances featuring additional benefits for tyre production and tyre quality.

This double extraction technology for the production of environmentally compatible extender oils requires a vast understanding of the process and expertise. EDL is capable of achieving the necessary capacity increase of the existing solvent extraction plant by advanced extractor internals and specific engineering solutions.

It is also possible to replace the very detrimental solvents of phenol and furfural by the more environmentally friendly solvent of NMP.

The necessary parameters can be determined by EDL on its own test stands and in cooperation with partners by means of product analyses and process simulations to adapt the relevant plant to the new conditions and convert it accordingly. ■

Test stand for the dewaxing/deoiling processes in Leipzig



SDA
BY PÖRRNER GROUP

No more residues!

Refinery. A combination of the SDA process and the Biturox® technology is capable of solving the issue of residues in a sustainable manner.

SDA
BY PÖRNER GROUP

BY ROLF GAMBERT

LEIPZIG/VIENNA. At fuel and lubricant refineries the issue of processing heavy residues is becoming the focus of attention. Due to the fact that the price of low-sulfur and easy to process crude oils is constantly on the rise the refinery owners are more and more interested in heavier crudes. Though more attractive in price they require a much deeper processing and produce additional residue quantities featuring a

higher pollutant burden. Now, that the statutory provisions have been toughened in 2015 prescribing the sulfur content of marine bunker oil to be 0.1 % rather than the previous 1.5 % refineries are looking for alternatives.

Time-tested processes in a new combination

Both the solvent deasphalting process (SDA) and bitumen production are time-tested technologies.

A combination of both can solve the issue of residues.

By adjusting the SDA process to the production of bitumen-capable feedstock, it will be possible to process the heavy residues, the vacuum residues in particular, so that they become saleable products. By means of extraction where solvents such as propane, butane and pentane are used, the heavy residues are split at both undercritical and overcritical conditions into DAO (deasphalted oil) and pitch (asphalt).

At the fuel refinery DAO can be fed to an FCC plant or a hydrocracker to produce valuable petrol, diesel and fuel oil, and at the lubricant refinery it can be used as bright stock for the production of lubricants.

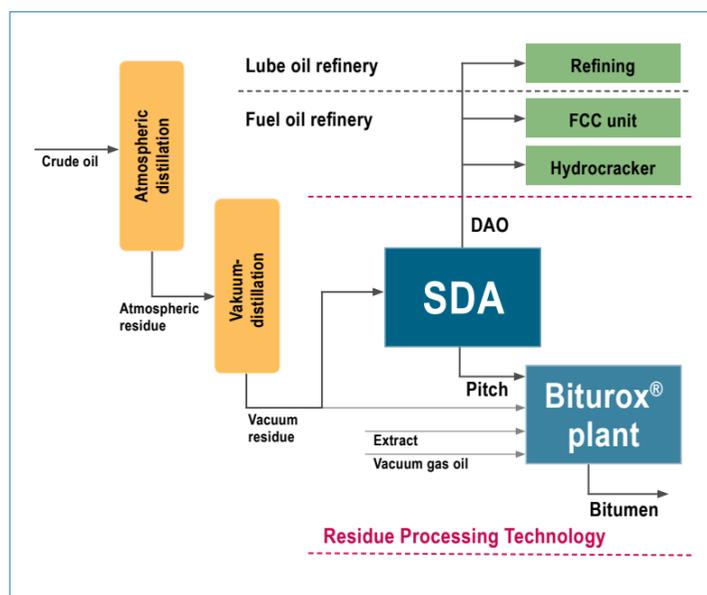
By adding aromatic oils the bitumen-capable pitch is processed in a Biturox® plant to obtain high-quality bitumen products. The weatherproof inclusion of companion substances provides for an environmentally compatible solution of the pollutant issue of heavy residues.

Criteria to find out whether or not the pitch is bitumen-capable are the paraffin content, asphaltene content or the viscosity at 135 °C. But ultimately concrete blow tests and examinations of the pitch, such as penetration, softening point or ageing properties are decisive factors.



Data and analyses for the scale-up are supported by the experience gained from the propane deasphalting plant built for H&R Ölwerke Schindler, Hamburg, Germany

Process flow diagram of an SDA plant combined with a Biturox® plant as part of an advanced residue technology.



The solvent deasphalting plant is optimized in such a way that both high-quality DAO and bitumen-capable pitch can be produced. Own test facilities for the SDA process in Leipzig and for the Biturox® process in Schwechat deliver important process parameters that are used for an optimized process design.



THE PERSON

Dr. Gambert studied process engineering at the Magdeburg university. As a specialist for distillation columns and column internals he is involved in projects at home and abroad. Back in 2005 he began dealing with the development of the technology of solvent deasphalting and dewaxing/deoiling processes.

In summary

An exact adjustment of the SDA and the Biturox® process allows for an almost complete processing of residues and is also the most cost-effective residue processing method of maximum benefit. ■

FORMALDEHYDE + DERIVATIVES

Gunther von Hagen's „Body Worlds“ would not exist without formalin. The process of decay is inhibited by formalin.

NEW FOR-MALDEHYDE WEBSITE

To provide more background information on formaldehyde and its derivatives, a separate



technology website was created. The formaldehyde.porner.at site gives an in-depth overview on formaldehyde, the two most frequently used processes (silver catalyst and metal oxide processes), and their pros and cons as well as their derivatives and fields of application. In addition to the overview on reference plants certain technology-related documents can be downloaded as pdf files.

Know-how for specialty chemicals from Pörner Grimma

Formaldehyde. Pörner Grimma can look back on decades of experience in the design and construction of plants for the formaldehyde product family.

BY GERHARD BACHER

GRIMMA. Pörner plans, designs and builds highly specialized plants for the production of special-purpose plastics and chemicals. Teaming up with renowned European licensors and know-how partners the engineering office offers a large range of formaldehyde downstream systems for the

production of formalin, hexamine, pentaerythritol, glues, resins and novolaks. The plants and units are planned completely in-house and supplied based on EPCM (engineering) or turnkey contracts. Plants of this line have been built and put into operation in Hungary, Germany, Austria, the Czech Republic, Russia, the USA and Canada, among them the world's second

largest formalin plant in Gubakha/Russia.

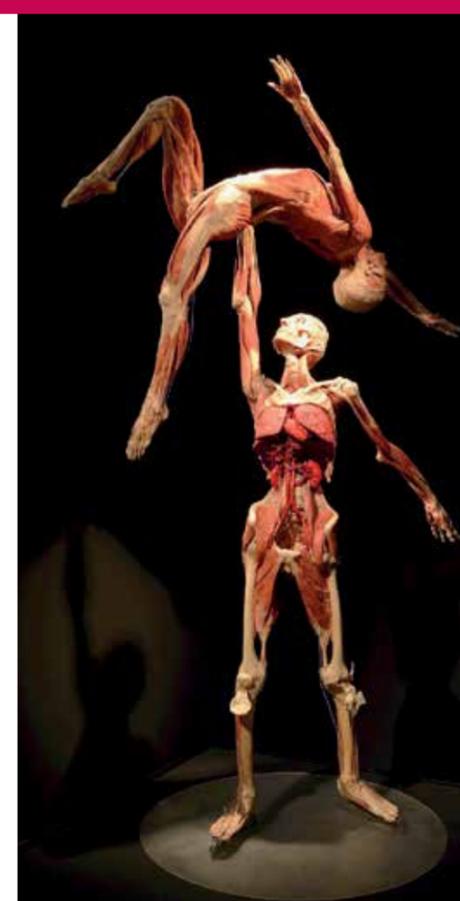
The team is constantly working on extending the range of services and technology optimization. ■

Project team of the methanol plant for the JSC Ural Methanol Group at Nizhny Tagil, Russia.



THE PERSON

Gerhard Bacher studied mechanical engineering in Linz and business management alongside his work. From 1981 to 1988 he worked for the Pörner Linz project management. From 1988 to 1991 he was project manager and worked in R&D for VAI. He joined the international sales department of Pörner Vienna in 1991 and runs the Grimma office very successfully.



Bound by tradition

The Sperl. The Café that inspired a polka by Johann Strauss



BY MARGOT SIMONIS

VIENNA. Everyone craves a short breather with a cup of coffee now and then. Therefore, this year, as for many years, the „Engineers' Café“ is an important hot spot of our booth at ACHEMA.

The Viennese coffee culture

The Viennese coffeehouse culture can look back on an illustrious and almost 500-year tradition. In the 19th century, the coffeehouse used to be a living room and leisure club, a favorite haunt of Vienna, while the ladies were allowed access, only in male company if even that.

The Sperl, a dance hall in the suburbs of Vienna, during the Vienna Congress, was one of the most popular entertainment venues in Vienna. In the big dance halls, balls were organized with the famous Strauss family of musicians. Johann Strauss dedicated three dances, including the Sperl-Polka to this particular venue.

Today the Café Sperl is reminiscent of the great days of this dance hall. The café has its patina preserved with a hint of sentimentality. Every visitor here is a „regular“ in the best sense of the word and this is the tradition we want to preserve at our Engineers' Café.

The „real“ Café Sperl is located in the 6th district of Vienna. ■

The „real“ Sperl Café in Vienna



On the steps of Hugo Junkers

Company outing. EDL on a tour to discover Dessau, the Bauhaus and the Ju-52.

BY ULRIKE FISCHER

LEIPZIG. Every year EDL and the office managers of the Pörner Group join forces to go on a discovery tour. And so they did early September 2014. This time Dessau in Saxony-Anhalt was on the agenda.

First stop. The „Hugo Junkers“ Museum of Technology opened 15 years ago at the site of the former Junkers Flugzeugwerke thanks to an initiative of a very active friends' association. This museum gives an



The „Tante Ju“ in Dessau

insight into the life and works of Hugo Junkers as an engineer, entrepreneur and inventor.

The main showpiece of the exhibition is the legendary „Tante Ju“, a Ju 52 airplane the inner life of which makes the hearts of technology enthusiasts leap for joy.

Second stop. The new Meisterhäuser (Masters' Houses). Not far from the well-known Bauhaus in Dessau you can find them. In 1926 Walter Gropius as Bauhaus director and the Bauhaus masters Kandinsky, Feininger, Moholy-Nagy, Muche, Schlemmer and Klee moved in there. On guided tours we learnt a lot of things to know on Bauhaus, the Bauhaus teachers and the new Masters' Houses – a modern interpretation of the houses based on old ground plans.



The performance of the managing director Andreas Pörner

The highlight of this evening was the singing by our very own shareholder Andreas Pörner accompanied by the charming saxophonist Kathrin Eipert earning them standing ovations.

As in previous years we can take a positive feeling from this trip – a successful outing with interesting topics that has strengthened the team spirit. ■

Third stop. The best things come in threes. The so-called „Kornhaus“ is a restaurant of Bauhaus architecture where the very eventful outing was concluded with a party in a way that is right and proper for plant construction experts.



Final at the Kornhaus



ESC - Engineering Sailing Cup 2015

Sailing. As the winner of 2014 ESC the Pörner team organized this year's regatta for sailing enthusiasts.

GREECE. In early May this year, the ESC Engineering Sailing Cup took place for the seventh time, which was launched by Arno Hemm in 2009.

According to the motto of common ideas creating connections, this regatta is the ideal framework for the participating engineering companies and crews to deepen friendships and make new contacts. To preserve the family atmosphere, the number of participants is limited to only ten boats. The previous year's winning team is responsible for the organization of the next year's race.

And so the Pörner team carrying the prize trophy with them, started the preparatory activities for the 2015 ESC already back in June 2014. The Cyclades were chosen as venue, the six courses and daily stages determined and the

yachts chartered.

This year there was a total of 57 sailors from Germany (with two dear guests from Australia and Jordan), the Netherlands, Switzerland, Great Britain and Austria participated. The participants

The Pörner crew on board of the Perseus



were spoiled with six days of glorious sunshine complemented with intense physical exertion as well as wonderful celebrations.

The Pörner Crew is now a well-established team and did an excellent job organizing the event.

This was particularly evident when Zeus – Commodore Eugen Gotter – injured his Achilles tendon. Within one day, he was flown to the State Hospital in Linz where he underwent surgery.

Left behind were Dionysos Peter Schlossnikel, Ares Wolfgang Kursch, Poseidon Manfred Deutsch and Apollo Klaus Prexl who equipped with enough ambrosia and nectar kept their folks happy at the big theme night.

At the Prize Giving Party, gold medals and trophies were officially presented to the victorious crew of the Sulzer company with skipper Hendrik Baur.

Until the last stage they had an exciting duel with the boats of Arno Hemm (Germany) and Mike Theobald (England) for the overall win.



Fair winds until next year and the best of luck and success in organizing the ESC 2016! ■

Engineers with heart and sails!





Pörner Projects

creative. innovative. productive.



New column of the Desulphurization Plant DK2
PCK Raffinerie GmbH, Schwedt / Germany, 2014

PROPANE
DEASPHALTING

SDA

BY PÖRNER GROUP

PDA
extraction
columns for
Belarus by
EDL

LEIPZIG. Shortly before the end of 2014, EDL signed a contract for the technological design and supply of two extraction columns for a propane deasphalting (PDA) plant to be revamped. This contract is the result of EDL's long-term development of the specialized technology in the field of deasphalting for industrial use. This project is also the first contract for the Pörner Group in Belarus.

The advantage for the customer in this project is obvious. In our own pilot plant, the existing technological conditions were tested, and a comprehensive process optimization has been carried out. This has provided the customer with reliable information on the expected product quality and yield at an early stage of the project.

Besides the solvent deasphalting technology EDL offers an entire range of services. With the help of pilot tests and theoretical simulation models concrete statements for the entire plant process all the way to the finished production plant can be made. These data are the base for economic calculation and efficient and effective handling of a project. ■



Minsk, Belarus

BELARUS

The Republic of Belarus (formerly Byelorussia) is an Eastern European landlocked country bordering Poland, the Ukraine, Russia, Latvia and Lithuania. With an area of about 60 % of Germany it is the largest entirely landlocked country in Europe. According to the UN, Belarus has the highest standard of living in the CIS countries. It is an important transit country for the supply of Russian oil and gas to Europe.

Biturox® in the Middle East

Refinery. The oil-producing countries have been very interested in the Biturox® process. Seven new licenses have been awarded. An interview with Wolfgang Heger.

The majority of leading oil companies around the world operate the Biturox® system and thus produce about ten percent of global demand for road bitumen. In the past decade, a total of 26 Pörner Biturox® licenses have been awarded.

Now the oil-producing countries of the Middle East are increasingly interested in the Biturox® process. We asked Wolfgang Heger, the sales manager for the Biturox® technology, for their reasons.

W.H.: The oil-producing countries in the Middle East have substantially expanded their refineries and petrochemical plants to process the crude oil produced locally. On the one hand the final products are exported with a higher profit and on the other hand, they are covering the growing need for infrastructure in their own regions. Because of the prospering and growing construction industries and the economic boom in the Gulf region, the demand for bitumen has increased, which is why Biturox® plants have been included in the overall concept in the refineries.

In the last five years the basic engineering design has been created for seven new plants in the Middle East alone. Of these plants, three are already in the

construction phase.

Ed: Is it possible to increase the yield by introducing the Biturox® technology?

W.H.: Of course. Refiners are increasingly interested in an

the process. Thus, the feedstock can be continuously processed into a homogeneous and stable product.

Secondly, this world leading technology can produce high-quality bitumen in an economically

different types and grades of crude oil. Therefore, refinery residues are also very specific. How can Pörner create a customized design for each refinery?

W.H.: In the production of quality bitumen the expertise lies in the selection of the right feedstock, the mixing of these as well as the processing method. After having awarded nearly 50 licenses, Pörner has gathered data from several hundred bubble-test runs with samples of crude oils from all around the world. This information can be defined and customized to ensure the correct interpretation. In our own pilot plant, the data is evaluated and adjusted by means of test runs.

Ed.: Thank you for the talk. ■



efficient residue recovery and Biturox® has much to offer to satisfy that need.

Ed: What other advantages does the Biturox® technology offer them?

W.H.: Let's start with the top three advantages: First, compared to conventional bitumen blowing systems, the Biturox® process has a considerably shortened reaction time and the conditions are accurately controllable throughout

the process. With a suitable design in the refinery operating process, various residual products including the heavy refinery residues are processed into high-quality road paving bitumen.

And thirdly, a Biturox® plant is compared to other refinery units a relatively small investment. It can also easily be operated at a high automation level in a modern refinery.

Ed: Every refinery processes



THE PERSON

Wolfgang Heger began working at Pörner Vienna in 1993, after his training as a mechanical engineer. From the outset, he worked in sales management, advising clients about the planning of Biturox® plants.

Expansion for a wax plates
facility for AMOC Egypt

Chemicals. Pörner technology enables the export of wax products.

ALEXANDRIA. In October 2014, the wax plate production facility of Alexandria Mineral Oils Company (AMOC) began after a 14-day plant shutdown in the now extended operation.

A year earlier Pörner Romania was awarded the contract to expand the existing plant from six production lines to eight lines to meet the growing demand in the industry for pure paraffin wax.

The scope included the turn-key planning for the entire plant extension, including basic and detail engineering, procurement and delivery of new plant components, adaptation of the cooling system, replacement of the entire control system (PLC) as well as construction supervision and commissioning.

Technology

The Pörner Group has extensive process engineering knowledge and experience in the field of waxes and wax molding and packing. Additionally the group has key knowledge in the process and technology of spray micronization as well as wax slabbing.

As early as 2000 Pörner did the process design for the entire

plant in Alexandria. Pörner also supplied the key equipment for the plant as well as the complete system control.

For the 25 percent increase in capacity of the production plant the temperature settings of the wax in the production facility (the heart of the plate production plant) were redesigned and the design of two additional production lines improved.

The plant

The plant produces both hydrogenated and non-hydrogenated paraffin waxes for candles, the pharma-

ceutical industry, cosmetics and food industry.

The hot wax, a by-product of the production of lubricating base oil, is poured at a temperature of 90 °C into a total of eight production lines of molds and is then cooled down in shape. After they have cooled, the five-kilogram wax plates are packed five pieces to a carton, for onward transportation to the customer.

The capacity, for the production of pure paraffin wax, of 4.8 tons per hour, in two shifts, and up to 23,040 tons each year, corresponds to a volume of more than 1,150 truckloads. ■

Production plant in Alexandria

Two new
and kero-
New construction.

BY PETER SONNTAG

NIZHNEKAMSK. Modern sulfur-free fuels are an important foundation for economic development in the CIS. Contributing to this are the two new hydrodesulphurization plants for kerosene and diesel in Nizhnekamsk, which were planned by the EDL in Leipzig.

The project

Late in 2012 EDL was commissioned with the planning of two HDS units for JSC „Tatneft“. EDL was responsible for the complete detail engineering, procurement services and project management. The two plants are part of a new project within the refinery and petrochemical complex in Nizhnekamsk / Tatarstan.

EDL has a lot of experience in plant engineering and design when it comes to refineries. Nevertheless, the parallel planning of two hydrodesulphurization

Turnkey LPG loading facility handed over



Gas processing. Poerner Romania completed the turnkey LPG plant contract for OMV Petrom on schedule.



BY MICHAEL VOLKMANN



PLOIESTI. In August 2013 Poerner Romania was appointed as general contractor for the planning and construction of a truck loading facility for LPG by OMV Petrom. In March 2015, right on schedule, the LPG / GPL loading station was handed over to the customer. The turnkey contract included the necessary permitting as well as, both the basic and detail engineering, procurement, project management and site supervision and finally, the commissioning of the site.

The investment in the Petrobrazi refinery enables two trucks to be loaded simultaneously with liquefied petroleum gas. The plant has a total capacity of 240 tons a day. Working in two shifts, about

20 trucks can be filled daily. In Romania, LPG is mainly used as an alternative fuel for motor vehicles, but also to heat homes.

Process know-how in the gas sector

For the process engineering and design of the overall plant, the special requirements of butane and propane gas had to be taken into account. Pörner did the planning and construction including the necessary infrastructure for the projects. The connection to the existing refinery network, as well as the access control system with fully automated accounting system, ramps, pump house, control unit, lightning protection and the fire & gas alarm system were all included.

The project was successfully commissioned on schedule and took HSEQ policies into account for operation. The total value of the project amounted to EUR 4.6 million.

POERNER ROMANIA: THE GAS SPECIALIST

The realization of this LPG loading facility is the first turnkey project for Poerner Romania. It is an important milestone for the Romanian subsidiary and reinforces customer confidence in the performance of all departments on site. It also strengthens the company's position as a specialist in the gas sector. This is the third LPG contract in three years for the company. The process knowledge of LPG or GPL based on the references on the Ploiesti site can be now used for other customers and projects.



NOTE

BY ROLAND EICHINGER

Electrified



PLOIESTI. In April 2015 Poerner Romania successfully completed an EPCM project of a 5 MW steam turbine at OMV Petrom. The plant is used to generate electricity as well as low- and medium-pressure steam. The generated electricity is fed directly into the company's own refinery network.

The scope of work has been performed on the basis of the basic engineering provided by the customer. Poerner Romania did the detail engineering in accordance with the client specifications, including construction supervision, training and commissioning. During the project a number of necessary adjustments of the basic engineering had to be considered respectively constantly adapted according to customer requirements. This flexibility contributed significantly to the success of the project.

Technical challenges

The stress calculation of the steam pipes (30 bar, 300 °C) had to be optimized in detailed tests and a verifiable solution had to be found. Similarly, the structural requirements for the turbine house were very tight, typical of a „brownfield“ project. This was an almost impossible task for the Pörner team but was handled efficiently and solved with an optimized plant layout and goal-oriented collaborations of all the project participants.

OMV Petrom and Pörner are pleased with the successful commissioning of the turbine and the timely delivery of the plant.



desulphurization plants for diesel sene in Tatarstan



A good example of working across locations within the Pörner Group is the planning of two HDS plants for JSC „Tatneft“.

plants, their integration into the existing refinery, compliance with the Russian regulations, language barriers and the involvement of local Russian and Ukrainian subcontractors, presented the project team with major challenges. The young, dedicated team on the customer side supported EDL and helped the team with the successful realization of the projects.

Transnational cooperation

In project management, the synergies of the Pörner network were utilized. They were made up of four Pörner locations - EDL Leipzig (Germany), Pörner Linz (Austria), Gazintek Kiev (Ukraine) and EDL Engineering in Severodonetsk (Ukraine) - being permanently in contact.

EDL was responsible for the process engineering, machinery / equipment, procurement services, project management and coordination of the external

project partners for electrical engineering, instrumentation and civil / structural. Pörner Linz took over, with the support of Vienna colleagues, the administration and processing of the PDMS model. EDL Engineering in Severodonetsk incorporated into the group, as a joint venture planning company, realized the planning of the C & I installation project. Our colleagues from our „sister“ Gazintek in Kiev were involved in the project to help cope with the large piping design package.

Intensive exchange of experience

Under this joint project, all Pörner employees involved have realized the benefits of this interaction of multiple sites right into the working scale and have come to appreciate it.

This integration should also be deepened with future projects, so that more benefits can be reaped from the expertise and experience of the individual sites.



After work: The international team celebrates with a small garden party

THE PERSON

Peter Sonntag studied process engineering at the Technical University of Freiberg. After three years as a research engineer, he gained a lot of SME experience as a project engineer in international mechanical engineering. In 2001 he joined EDL, where he worked first in sales. Since 2006, he has worked as a project manager. Here, the focus of his work has been on foreign and international projects.



Revamp of FCC and alkylation plant

TOTAL Refinery. Successful project completion in T&I of TOTAL Leuna



TOTAL Raffinerie Mitteldeutschland GmbH



Lift of reactor dome „Medusa“ for the FCC reactor 2014

LEUNA. Last year TOTAL Raffinerie Mitteldeutschland GmbH saw a comprehensive T&I, another name for the refinery MOT, with the aim to improve the efficiency and obtain more chemical primary products from the crude, such as propylene, to be able to respond to the changing market requirements. The larger part of the EUR 65 million total investment went to the revamp of the FCC and alkylation plant.

For this project, EDL had been entrusted with the detail engineering, project management and support of equipment procurement and commissioning. These planning activities revolved around the FCC gas processing unit, alkylation unit and the FCC reactor.

The aim of the revamp of the FCC gas processing unit and the FCC reactor was to improve the yield structure. The reconstruction of the alkylation unit was done to increase the quantity of the alkylates produced. The latter are added to petrol to increase the octane number (antiknock properties of a combustion engine).

Novelty: Split of work into Pre-T&I and T&I

For the first time TOTAL and EDL divided the work into pre-T&I (prior to shutdown) and T&I (shutdown).

The pre-T&I scope of work was awarded based on a contract for work and services. The necessary limits of performance were marked by EDL in the final design documents.

For the work to be executed during the T&I, TOTAL engaged a unit contractor responsible for all activities of the 'usual' shutdown program and the project-related work to be conducted within the T&I time limit. The relevant activities were mapped to-the-day by the contractor using the ROSER system and later also used for billing.

Another challenge for the

project team was the on-time procurement and delivery of the equipment. From the procurement side it made sense to do package purchases of materials and then spread them over the individual time slots.

Conclusion

A split of the scope into pre-T&I and T&I is feasible but needs more effort in the planning phase. It does, however pay off if the implementation phase if it is properly prepared, and it eases the burden for the project personnel and operators.

The successful completion of the three projects is more evidence of TOTAL's confidence in EDL's plant revamp competence.

REVAMP BY PÖRNER

New HDS3 reactor for the desulphurization plant at OMV

OMV. Refurbishment by Pörner and EDL

SCHWECHAT. The HDS3 plant of the Schwechat refinery commissioned back in 1981 is designed for the desulphurization and NO_x control of vacuum gas oils with boiling range between 250 to 600 °C. Since the mechanical service life of one of the two reactors will expire in 2016, it will be replaced by a new one to be integrated into the system in April 2016.

The HDS3 project

EDL and Pörner Vienna were awarded the contract for the refurbishment of the HDS3 plant. The contract includes the basic and detail engineering, procurement of equipment as well as construction supervision and commissioning assistance.

The EDL/Pörner team provided the FEED as the basis for the cost estimate incl. all necessary engineering documents and implementation strategies. Part of the FEED included the ordering of long-lead items for the new reactor. The reactor will be supplied and installed in June 2015 and integrated into the refinery system in April 2016.

The new reactor

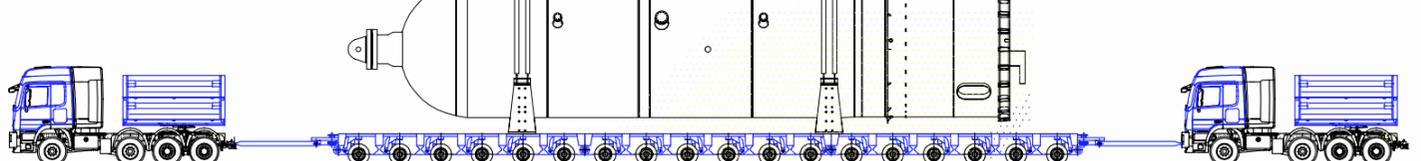
For the annealing of the reactor a separate workshop of 25 m in length, 8 m in width and 8 m in height was set up of slabs featuring a heat resistance of up to 700 °C. The annealing process takes almost four days with a fuel oil consumption of about 10,000 l fuel oil. The reactor is heated to 690 °C being kept for a period of 10 hours and then cooled down to 300 °C within 40 hours.

The new reactor that has a diameter of 5 m and a total height of about 24 m has been designed for a temperature of 465 °C at 80 bar.



Welding of the reactor by MAN Diesel & Turbo at Deggendorf 2015.

More information on the erection of the 380 t reactor will come with our next edition.



COMMITMENT FOR OMV

In the past the Pörner Group has been repeatedly involved in OMV refurbishment projects, among them, the RD4 Project (replacement of equipment for the crude distillation plant 4) in 2013/14 and Butamax (capacity increase of butadiene production plant). Pörner was entrusted with the basic and detail engineering, procurement of equipment and construction supervision. The planning and design took place based on close cooperation between EDL and Pörner Vienna. To optimize the shutdown periods of the plant, detailed erection and operating schedules were prepared prior to the shutdown proper.

Thomas Gangl, head of the Schwechat refinery said, concerning the revamp of the butadiene plant: „We have managed to complete the investment at ten percent below the budgeted EUR 30 million, as well as a month ahead of schedule. The plant also worked sensationally, right away.“ (Source: Wirtschaftsblatt, November 5th 2014, p. 6)



New projects from PCK



PCK. EDL entrusted with revamps of crude oil and FCC unit

SCHWEDT. In spring 2015 EDL was entrusted once more with technologically extensive revamps for PCK Raffinerie GmbH. The scope of work includes, for example, the replacement of the vacuum column of the crude oil unit and the replacement of the regenerator of the FCC unit during the 2016 shutdown.

The basic design of the new vacuum column (dia. 3,200/8,500/7,000 mm, total length of about 61 m with all attachments and internals weighing about 760 mt) and an early work program for the column engineering have been completed already. The detail engineering including the technical and commercial parts of procurement is now in progress. Construction supervision of the crude oil unit is to begin in June.

The detail design and

procurement for the regenerator replacement project of the FCC unit are running in parallel. The site is expected to be mobilized in September with the transport route and the pre-assembly area for the regenerator components to be established first.

To round off the work package for the complex shutdown in 2016, EDL is working on several smaller projects in the individual plant units. In the crude oil unit the work consists of the replacement of the stripper column and the LCO recovery project in the FCC unit.

The time schedule for planning, procurement and pre-assembly with all construction activities including the assembly of large-size equipment at site is a tight one. As usual the scheduled shutdown periods of 21 and 23 days resp. are short. ■

Lift of vacuum column, 2013



OVER 20 YEARS OF PARTNERSHIP ON THE BASIS OF TRUST

The PCK refinery has been one of EDL's regular customers since 1993. Since then a large number of smaller, but mainly larger projects, have been implemented jointly. Among them are some very impressive projects, such as the propylene splitter (84 m) being the tallest structure in the area, or the refurbishment of the vacuum column VT3 during the 2013 shutdown (see photo).

EDL as a revamp specialist, refurbished a large number of units at the Schwedt refinery already. Personnel and location of the refinery are known and the work processes familiar, in particular during shutdowns.

In view of the skills and competences of the staff and the good cooperation of the teams no one involved has any doubt that the current revamp projects will be completed again in good quality and onto schedule to reward the trust placed in EDL. ■

EMPEDED ER GROUP

EDL refurbishing the DK2 desulphurization plant for PCK

PCK. HAZOP project has plant safety in the refinery's focus

SCHWEDT. Though EDL, as a revamp specialist, has a wealth of experience, every revamp brings a new challenge and so did the HAZOP DK2 project for the PCK Raffinerie GmbH in Schwedt. In 2014 after a short preparatory period EDL provided the basic and detail engineering, permitting, procurement and construction supervision.

HAZOP measures were to be implemented during the project to boost the plant safety. The project included the erection of a new cracker of 4,400 mm in diameter and a weight of 155 mt and the replacement of the stripper

column of 1,990 mm in diameter and a height of 32 m in the middle distillate desulphurization plant DK2.

The shutdown period for all maintenance and project activities in the medium pressure section was 13 days.

The cooperation of all parties involved made it possible to optimize the time-critical activities (dismantling of old column and existing column foundation, placing of a new 120 mt foundation and erection of new column) and complete the project and hand it over to PCK one day ahead of schedule. ■

New reactor of DK2 unit of PCK Raffinerie GmbH, Schwedt, 2014



The petrochemical assignment

Interview. We talked to Andreas Windisch to learn more about the long years of cooperation with Borealis.

Since 2010 Pörner Vienna has been running a small office at Borealis Polyolefine GmbH in Schwechat where various projects have been realized. We spoke to the manager Ing. Andreas Windisch.

Ed.: Pörner has been providing engineering services to Borealis for quite a number of years here at Schwechat. How does the cooperation function?

A.W.: Well, as a team of 15 at the site we provide engineering services in close cooperation with the Borealis project managers. In the day-to-day business these are mainly maintenance jobs in the E/I&C, civil and piping areas. But investment projects, small to medium-sized, are also autonomously realized where we team up with our parent company in Vienna when major projects are concerned.

Ed.: Can you name some bigger projects of the recent past?

A.W.: In January 2015 a new buried raw material tank was put into service in the LDPE plant. Worth mentioning is also the complete reconstruction of the recovery area of the RP2 plant that was completed and commissioned successfully and smoothly two weeks ahead of schedule following weeks of hard work.

Currently (May 2015) the com-



Refurbished recovery area of the RP2 plant commissioned two weeks ahead of schedule.

missioning of the raw material cleaning system part 2 of the PE4 plant is in full swing.

Ed.: What are the advantages of having an office in the field?

A.W.: We are usually commissioned soon after idea generation and assist the Borealis project managers and process engineers in developing the project and determine the expected costs. As soon as a project has passed all necessary conceptual stages we are commissioned and work with the Borealis project management

until completion of all disciplines and handover for production.

Since our office is located right on the spot, let's say within a call of the Borealis project managers and maintenance staff, the exchange of information usually begins with the morning coffee, rather than sending emails to and fro. We have thus developed a close relationship on friendly footing and we trust each other. This kind of positive working environment makes things much easier.

Ed.: Is it a routine job or do sur-

prises happen now and then?

A.W.: Since our tasks in almost all engineering disciplines are so various we never have a routine job. Especially when it comes to plant shutdowns, stops and commissioning operations the unexpected must be expected. A lot has to be done and coordinated to make sure that everything goes smoothly and within a reasonable period of time.

The challenge to accommodate so many things is often exciting. Surprises happen especially if there is a lack of information on the situation at site and the relationship between the individual units.

Ed.: After all these years of working together – What is your opinion?

A.W.: Many years of cooperation have had a very positive effect on the entire cycle of project execution and activities. We, as engineering partner, are familiar with the flow of production and maintenance and are thus able to coordinate activities and processes in the best possible manner. We regularly attend training courses and keep us updated and pass on this knowledge to our colleagues. It is a win-win situation.

Ed.: Thank you for the interview.



NOTE

Selected projects for Borealis

- New construction of the polyethylene large-scale plant PE4 (2005)
- General planning of PE plant expansion by a black coloring (2008)
- Engineering support for an HDPE plant (2007)
- Revamp of polypropylene pilot plant (2010)
- Major order for the modernization of the Linz site (2013)



THE PERSON

Andreas Windisch, mechanical engineer and automation technologist, began in 1998 as a design engineer in the Piping department of Pörner Vienna. After four years in the IT industry, he returned to Pörner in 2005 as a site coordinator, focusing on piping engineering. He played a leading role in the project PE4-black coloring in 2008 and has since 2010 led the Pörner office at the Borealis site in Schwechat.

ALLIANCE ENGINEERING

A win-win system for all parties

Alliance engineering agreements make it possible for major industrial firms to get access to engineering services whenever it is needed (new plants, revamps and streamlining). Framework contracts have multiple benefits for both parties of the contract.

Benefits of the Alliance engineering concept

- All plant engineering and construction projects from cost-plus work through to the completion of a turnkey plant can be implemented at minimum cost when it comes to administration.
- The plant owner can choose from a pool of familiar people and defined qualifications.
- Confidentiality of the processes and operating conditions is thus ensured.
- The engineering firm can plan ahead in terms of capacity utilization in a better way
- Fixed hourly rates allow for an "open book" cost estimate.
- The contractual standard

conditions define the warranties and liabilities and minimize the risk of conflicts in project execution.



Conclusion

The Alliance engineering concept is a win-win system for all parties involved. The client gets a good result because the alliance partner is certainly interested in getting another project. So the partner can expect good capacity utilization in the long run. Disputes and additional claims become less frequent.

Lubricant blending technology from Leipzig to Korea

Project briefing. Capacity increase of world-scale lubricant blending plant.



Since 2012 EDL has been in charge of the maintenance of the process control system and the controlled blending unit of the lubricant blending plant of GS Caltex Corporation Seoul / South Korea. In autumn 2014 EDL was commissioned to increase the capacity of this plant.

The plant

It is a lubricant blending plant that has a Simultaneous Metering Blender (SMB) and a metering manifold. These facilities are used to mix base oils and additives. As part of this project the core of the plant was extended by additional production lines and the software of the process control system was upgraded.

This plant is one of the world's most advanced large-scale plants. The highly automated blending concept provides for an annual capacity of about 250,000 metric tons. As much as 30 to 40 batches can be blended every day.

The project

The focus of the project was on the technical and commercial

project management and procurement. All German suppliers and sub-contractors were coordinated by EDL. The benefit for the customer: "Made in Germany" quality in form of a complete plant from a single source.

The good interpersonal relationship made it easy to overcome minor hurdles of cultural differences and the 8 hour time difference.

Quality and adherence to schedule

The system was completed according to the specified quality and delivered on schedule. At the end of February 2015 the customer signed the acceptance certificate confirming the completion of all services by EDL including the as-built and manufacturing documentation. In March the plant was put into service by EDL.

EDL as "approved exporter" saves money for the client

Since no proof of preferential status is required for the trade of goods between Germany and the Republic of Korea, a preference

document, such as a declaration of origin, can be issued by an Approved Exporter. Within the framework of the project EDL had certified itself as an approved exporter, thus receiving authority for a simplified export. EDL can thus help the customer to save customs duties of up to 20 % for the system supplied and any future supplies.

The world-scale lubricant blending plant is highly automated and generates 30 to 40 batches a day.



It is never too late!

Food Industry. With dedication and an eye for the “whole” - everything is possible.

BY PETJA FIEBINGER



VIENNA. Pörner, as a general contractor, knows how to look at projects holistically and is able to handle them competently. This widespread view also helps small commercial and industrial enterprises save costs and be more competitive in their industry. In this vein, Vienna Frey Delikatessen GmbH were handed over the „Relocation and capacity expansion of food production“ project that was completed successfully by Pörner in May 2015.

The project

Two adjacent halls, in total 12,000 m² large, have been adapted for the three main production lines and the adjacent administration building was adapted to become the headquarters and meeting place for the company, both technically and aesthetically meeting the needs of the client.

For food production, very complex regulations must be observed, such as hygiene as per IFS

(International Food Standard). In addition important factors for the buildings structure had to be considered, such as the ventilation for the boiler plant - with a capacity of 3.5 MW, the permanent atmospheric steam load as well as additional lighting. Very complex fire protection measures had to also be taken care of and ensured in the design.

The implementation

Originally, six months had been envisaged for the reconstruction, the plans were already submitted to the authorities. Within four weeks the construction work was

to be commenced.

With the start of construction in January 2014 Pörner was called in to assist, in accordance with the consulting contract, the project with regards to authority engineering, procurement, construction and commissioning. Pörner complemented missing planning details, took over the processing of more than 80 regulatory requirements and provided the cost estimates for many sub regions.

The impossible becomes possible

Within a month Pörner had created a concrete schedule and a cost

„The euro, which one thinks to save when planning is usually paid twice in the procurement.“

estimate for the project. May 2015 was targeted and decided together with the customer to be a realistic date for commissioning of the site.

During construction solutions were developed on the go. The new equipment, such as a fountain, the steam boiler system and all steam, water and power lines had to be

measured and designed according to the customer's requirements as well as official obligations and had to be processed piece by piece. Had Pörner created and coordinated the authority engineering, the additional work and other compromises could have been avoided.

Conclusion

It is always worthwhile to screen project planning in its entirety and with good time to spare. Pörner offers also to small and medium-sized businesses the opportunity to save costs when implementing their projects and thus become more competitive. ■

Production at Frey Delikatessen GmbH, Siemensstrasse



Ship loading station for grain and feed in Pischelsdorf

General planning. New loading facility provides economic benefits for the industrial area of Pischelsdorf.

PISCHELSDORF. The Pörner Group, as a general contractor for this project, constructed a new ship loading and unloading station for grain and feed. This project had the value of around EUR 3.5 million. In March 2015, the station in Pischelsdorf, which was a joint project of Agrana and Donau Chemie, went into trial operation.

Pörner has been the general planner for this site since 2007, completing the bioethanol plant in the Pischelsdorf industrial park. Back then loading stations for trains and trucks were built for transporting grain raw materials, feed as well as ethanol. Since the site already bordered the Danube,

retrofitting a high-capacity ship loading station to the existing plant was the obvious choice.

Pörner was thus commissioned by the Agrana Stärke GmbH and Donau Chemie AG in the spring of 2014 to plan and construct a stationary ship loading and unloading station with an attached conveyor bridge. This system will allow and facilitate the supply of raw materials as well as to enable the further transport of feed products produced locally and at competitive conditions.

The 30 m high crane and the 22 m long conveyor arm can unload 300 tons of raw materials per hour or load as many tons of industrial

products in the same time.

The scope of Pörner included the general planning, that is, the first feasibility study and beyond – namely documents for approval by the relevant authorities, detail engineering for the civil part, mechanical and instrumentation engineering, site supervision for the construction as well as commissioning support.

The Plant

In addition to the erection of the loading crane, additions and alterations were made to the existing system in order to integrate the new ship loading station accordingly. Now ships with a standard volume of 1,000 tons can be unloaded or loaded within a few hours. This volume corresponds to about twelve railroad cars. While the raw material is moved over the reversible conveyor belt the amount can be determined by a calibrated weigh scale with an accuracy of ± 0.5%. ■

The 30 m high crane and 22 m long conveyor arm can unload 300 tons of raw material per hour, or as many tons of industrial products can be loaded.



Die Delikatessen Manufaktur

FULL COMMITMENT FOR THE LOCAL INDUSTRY

BY EUGEN GOTTER

„The revamp and improvement costs are by far cheaper than than 20 years of sub-optimal operation.“

Many medium-sized businesses have a hard time adapting to the prevailing regulations, the implementation of the Energy Efficiency Act as well as changes in security and planning authorities, this often stretches their capacity limits. Pörner Austria offers its small- and medium-sized customers comprehensive consulting and project management with the expertise of an industrial plant engineering company.

In the last 40 years, Pörner has designed and built numerous international large-scale plants. This know-how and expertise in process technology as well as advanced planning tools allow the company to handle projects within cost and on schedule. Not only big businesses benefit from this, even medium commercial and manufacturing enterprises can reap these advantages.

Pörner supports its customers from the very project idea, permitting through to the realization of an investment. The customer has access to experienced engineers from all disciplines in every phase of the project.

Whether large or small

The steps from a client's vision to the realization of a project or plant, for large industrial companies or small businesses, differ only slightly.

It is very time-consuming and complicated, especially for companies with limited staff resources, to seek and implement all applicable provisions for conversions, increases in capacity, site relocations or new



buildings. This is, in addition to safety regulations and necessary documents for official procedures, also very important for the process engineering design.

Pörner not only has the necessary knowledge, but also all of the necessary technical departments for the implementation of each and every project. This saves time and resources, and enables for the faster and more cost-effective implementation of each project.

Pörner assists clients in:

- Implementing the new Energy Efficiency Act
- Drawing up a safety master plan
- Permitting (permit application, EIA, notification of changes, audits)
- Analysis to increase efficiency, automation, etc.
- Selecting process components
- Cost estimates for planned investments

Professionalism and trust

Professionalism is important, but what matters is a partnership and the careful handling of confidential information. Such trust is not built overnight, but increases with time.

Many contacts have thus become Pörner regular customers with long-term business. This applies to large plant operators as well as to smaller industrial companies. ■

Boosting productivity by Pörner's ANLAGENBAU 4.0

WELCOME TO THE FUTURE

BY ANDREAS PÖRNER



Foreword

The global economy of today is more dynamic than ever before. This is why all potentials to boost productivity have to be exploited by the industry, to achieve a sustainable competitiveness for innovative products. "Industrie 4.0" originating from the IT sector targets this direction and is also interesting for the process industry.

Process plants, however, can be compared to factories for consumer goods, electronic equipment or motor vehicles to a limited extent only. Thus, especially for them Pörner has developed the concept "Anlagenbau 4.0".

The integrated process plant

Pörner's vision of "Anlagenbau 4.0" is based on the idea of improving all components of the process plant system in a holistic way as well as their impact on the productivity, rather than solely optimizing the information processing system. All parts must perfectly interact to ensure an optimally efficient, reliable and safe operation. The aim is to achieve an optimally safe operation by avoiding unexpected conditions or even breakdowns, i.e. minimizing the operator's risks.

Many of the plants currently running were built 20 or 30 years ago. The last few decades, however, have seen enormous changes, in practically all areas of plant technology – a result of ongoing specialization of the globally active equipment suppliers.

Holistic approach by Anlagenbau 4.0

According to "Anlagenbau 4.0" there are five main areas for optimization:

- Product quality:** Manufacture of better products with market-conforming capacity (improvements, flexible production, possible upgrading etc.).
- Optimal operation:** innovative processes, high efficiency in processing raw materials, minimizing utility consumption, high availability and operational safety.
- Energy efficiency:** application of energy-saving processes, selection of suitable energy sources (advanced heat exchangers, shifting of excess energy between plant units, security of supply by generating own electrical energy, utilization of waste heat, better insulation etc.).
- Man / machine interface:** high degree of automation, permanent monitoring and analysis of plant condition, occupational health and safety, training of plant operatives, provision of analytical data to host and ERP systems.
- Environmental compatibility:** resource-conserving production, closed circuits, use of recycled material, reducing emissions, approvability of plant, relationship to neighbors.

Process engineering and advanced tools

Process improvements are vital for the manufacture of innovative products. With the means available today they can be simulated and

calculated in a better and more correct way. Pörner and EDL have a wealth of process engineering capacities and have built a network with leading licensors.

It is possible today to "dry"-train plant operatives by adequately designed plant simulations.

Advanced, smart 3-D models document the status of a plant where all technical specifications are stored in databases. They are very useful for plant operation and maintenance and plant shutdowns, for example.

Self-learning plants are no longer an utopian dream

Pörner has realized that an optimal design of an entire plant cannot only be achieved by improving the IT system (smarter control and host systems). All disciplines have to make their contribution to achieve this goal.

Whether it concerns novel packings of equipment, novel designs of heat exchangers, machinery and systems of better performance characteristics or drives requiring less energy:

Almost all components of a plant have potential to be

"Almost all components of a plant have the potential for improvements."

improved.

Better materials are available today for equipment, machinery and piping. Smart components can supply data of their current condition in real time. More precise instruments provide for finer control and complete monitoring. Partial plant systems with "own intelligence" can be created to make the dream of a self-learning plant a reality.

Networked process control equipment for an information depth never seen before

It is no question that with "Anlagenbau 4.0" the elaborate, efficient information processing, constitutes the central tool for optimal operation of the plant.

Advanced IT with process control equipment, host and

are foreseen and avoided.

Important parameters of the plant, trend calculations and a smart alarm system with automated proposals of time-related necessary actions are implemented to recognize important situations and help the operator in critical situations. The IT facilities (interconnection, cloud, mobility) are capable of making these data available for controlling and management control in a more efficient way.

Operation can be organized with minimum energy and resources. The algorithms of the so-called "Fuzzy Logic" provide the plant with learning and self-control functions allowing for longer running times without maintenance stops.

The challenge is to compress the Big Data of a modern plant within the meaning of "Anlagenbau 4.0" in such a way that useful information on the condition of

plant owner and all engineering disciplines.

Also needed are experienced generalists, able to integrate the system elements to become an integral whole.

Experience has shown that efficiency can be greatly increased if components from all disciplines are specifically improved to follow the motto "the whole is greater than the sum of its parts"

It is therefore worthwhile to do an in-depth screen of the existing or planned production. The Pörner Group as general contractor is well-placed for that job.

It is Pörner's mission to sustainably optimize the productivity of a plant by the most advanced means, to guarantee the customer as investor and plant operator maximum competitiveness for many years. ■

www.poerner.at/anlagenbau4_0

SEQUENCE OF AN "ANLAGENBAU 4.0" PROJECT

1. Survey of current situation
2. Listing the owner's goals and requirements
3. Analysis of system elements of the plant
 - by engineering disciplines
 - holistic with interconnections
4. Defining the optimization measures (target status):
 - Process
 - Equipment, equipment components and systems
 - Automation and Monitoring
5. Cost-benefit analysis, budgeting
6. Implementation by economic priorities

the plant are made available to the plant operatives and economic parameters to the plant owner so that improvements and forecasts

FINDINGS

The experience with holistic analyses of production plants has also resulted in the following additional findings:

- Smaller conversions and fitting of components can be made on an ongoing basis as well as step by step.
- More often than not, a small improvement can give a comparably huge benefits for the project.
- Well-planned and prepared reconstructions of entire plants can be carried out as concerted action during plant shutdowns within a few weeks.
- When new plants are planned and built it makes sense to apply the best holistic concept from the very beginning making use of the best technologies, equipment and systems.

ANLAGENBAU 4.0

we create productivity

can be made and preventive measures taken for ongoing optimization of productivity.

Summary

Essential for "Anlagenbau 4.0" is the holistic view of the „plant system“ with due regard of all requirements as well as current and future conditions to be expected.

The implementation requires an active involvement of the

