

TECHNOLOGY

USED INTELLIGENTLY

RESIDUES INTO GOLD
Solvent deasphalting, article p. 3

Continual improvement ...

References + experienced staff + state-of-the-art methods = Pörner

For over 40 years the Pörner Group has been successfully engaged in process plant engineering. As an independent engineering firm solely committed to its customers we continually adapt to the needs of the industry by new ideas and methods.

The global competition of the process industry requires utmost efficiency as the key of success: Top-quality products are made efficiently and in an ecologically responsible way with energy requirement kept to a minimum.

To this end production processes have to be adjusted constantly: by converting and upgrading existing plants or building new ones.

Today process plants are operated more efficiently than

ever: highly automated by few highly trained persons. The operator's own resources to implement plant engineering projects on its own, are therefore often limited.

More than before it is necessary to build plants as quickly as possible and keep shutdown periods at a minimum. On the other hand lead times for special equipment have become longer due to the effects of globalization and new technology monopolies. So, engineering of high technical and social competence is in great demand.

In Europe the number of engineering firms dealing with general process plant engineering and construction is decreasing because most of the engineering firms focus on niches where they have established a strong position based on proprietary technologies. But the industry's demand is rising in terms of upgrading and extending its production.

References

Although the Pörner Group also offers niche products (bitumen, formaldehyde and derivatives), it nevertheless provides the entire range of the engineering disciplines from a single

source. Thus, Pörner as an all-round engineering contractor, is an exception with flexible and smart engineering services for almost all kinds of industrial facilities.

Our wealth of references is the living proof of our capabilities. The variety of projects undertaken whether for refineries, the petrochemical, chemical, steel and metallurgical, pharmaceutical, energy production and environmental sectors of industry, is where our engineers and specialists derive their practical experience from.

Experienced engineers

We take on new challenges and accomplish time and again complex, unusual tasks, such as new plants where processes have never been applied before (e.g. melamine plants of extreme requirements of 280 bar/420 °C); an briquetted iron plant featuring the world's largest reactors 60 m in height); facilities running under extreme climatic conditions completed within a very short period of time based on different national standards; plants in countries lacking proper infrastructure, or the conversion of units within a minimum of

time while the plant is running. We provide first-class complete solutions at maximum value for money for highly productive plants.

State-of-the-art methods

We as a group of medium-sized engineering offices use the same engineering tools as large plant engineering and construction companies and with over 500 engineers and specialists our engineering capacities are substantial.

When it comes to project implementation we pursue the principle of personal, cooperative communication because pleasure in working together is certainly the strongest motivation. Such working atmosphere makes it easy for up-and-coming engineers to grow into the company and add their fresh ideas and energy for the benefit of the company.

We know very well that our customers' success depends on our performance:

Therefore we attach importance to win-win relations with investors, suppliers and contractors. There is no other way for this field of business where short construction times, tight budgets and high technical re-

quirements are the things that matter.

That's Pörner

Together with our alliance partners and renowned industrial customers we have developed our own culture of professional plant engineering and construction in the German-speaking world demonstrated by a large number of projects implemented on schedule and within the budget. Our way of project execution on the basis of trust, flexibility, reliability and sanctity of contracts is increasingly appreciated by customers worldwide.

With creativity and intelligence we will continue translating our customers' ideas into productive plants by planning and supplying, installing and commissioning efficient machinery and equipment featuring a high degree of automation on schedule and within the relevant budget using prior art advanced tools.

Andreas Pörner
and Peter
Schlossnikel



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THE FIVE PILLARS OF PÖRNER'S SUCCESS

Independence

VIENNA. With its 500 employees or so at eight locations in four countries the Pörner Group is a separate, independent enterprise. It means that Pörner is committed to no one but its customers and can represent their interests independently.

The whole range

From the very first study through to the commissioning of a process plant Pörner has the all resources necessary to undertake feasibility studies, conceptual designs, basic and detail engineering, permitting, process design, detailed specifications of all plant components, procurement, stress calculations & structural engineering, construction management, training and commissioning projects. The customer can thus focus on essential decisions and rely on all planning and building activities going efficiently under the motto: "From a single source and cast from the same mould".

The Right Size

Though all engineering disciplines are available the Pörner Group is structured so that any kind of project can be undertaken whether small or large and that are worth 100 million euros or more. A direct hierarchy minimizes the cost of control and coordination and provides the flexibility necessary to implement even smaller investment projects cost-efficiently.

Flexibility

From the very beginning the Pörner Group has pursued a versatile approach. Since 1972 over 1,000 very different industrial projects have been implemented. Our reference list highlights projects for refineries, the petrochemical, chemical, steel and pharmaceutical but also the power and environmental sectors of industry.

Strong Teams

At eight locations Pörner employs plant engineering specialists who have the necessary know-how and expertise. Pörner's success builds upon the close cooperation of our engineers and specialists with the customers. This kind of cooperation enables our projects teams to implement projects on schedule and within the budget and make an idea come true to the satisfaction of all parties involved. (Roland Stickler) ■

VERSATILE AND EFFICIENT

Technologie - used intelligently

The Pörner Group has been on the world market with highly efficient technologies for bitumen, formaldehyde and other "engineering chemicals". When it comes to bitumen Pörner is second to none with its Biturox® process (mild oxidation process).

International references give customers the security of tried and tested systems. Customers of ours are BP, Shell, OMV, CEPSA, LUKOIL and other renowned corporations.

BITUMEN OXIDATION. Biturox®

The best answer to the rising demand for road paving bitumen

VIENNA. High-quality bitumen is a harmonic mixture of saturated and aromatic hydrocarbons, resins and asphaltenes (SARA).

Biturox® bitumen is made by physical/chemical modification to optimize the equilibrium between resins and asphaltenes.

By reducing the thermal susceptibility bitumen is produced that withstands extreme weather conditions and high traffic density and thus ensures a long service life of roads. (Wolfgang Heger) ■



Biturox® Plant in Parco, Pakistan

BITUROX®-PROZESS

Biturox® bitumen is made by way of "composition control" where existing, low-cost raw material components from the refinery are smartly combined. This mixture is chemically integrated under clearly defined and controlled process conditions by way of gentle air oxidation.

Biturox® Pilot Plant

BITUMEN. *Optimal process conditions and optimized product quality*



Biturox® Pilot Plant in Schwechat, Austria

VIENNA. The objective of the Biturox® application research is to combine feedstock available at reasonable cost at a refinery that in itself is no bitumen so that well-integrated paving bitumen of highest quality is obtained after the Biturox® reaction.

To this end the raw materials are analysed, feeds mixed

based on experience and multiple blow tests performed at the pilot plant until the target specification has been reached. The customer will then get reference samples for its own analysis.

The blowing times determined are essential for the reactor size. (Jana Foltyn) ■

COMPETENCE CENTER GRIMMA. Formalin

Indispensable for the chemical industry

GRIMMA. Based on the Dynea silver contact process devised in Austria the Pörner Group (Grimma office) has specialised in the last 20 years on formaldehyde plants. Since then more than ten plants have been built worldwide together with Dynea.

Various improvements have made it the best and most economical process of its kind. In addition to that Pörner Grimma has teamed up with renowned licensors building as EPCM contractor complementary units for formalin derivatives. (Gerhard Bacher) ■



Formaldehyd Anlage in Krems, Österreich

FORMALIN & DERIVATES

Formaldehydes and derivatives include: formalin, UFC, paraformaldehyde and hexamine, pentaerythritol, acetaldehyde, UF-MF-MUF glues/resins, alkyl resins, unsaturated polyester, Novolake and powder bakelites.

With over 500 employees the Pörner Group is one of the large plant engineering contractors in Central Europe.

The head office in Vienna and branch offices in Austria (Linz, Kundl), Germany (Leipzig, Grimma), Ukraine (Kiev) and Romania (Bucharest, Ploesti) form a potent network for the design and construction

of process plants.

Every Pörner site has its own technical expertise and capabilities:

VIENNA | AT: Refineries, petrochemical and chemical, power and environmental plants, bitumen oxidation (world's number one)

LINZ | AT: Industrial production plants and steel mills

KUNDL | AT: Pharmaceutical industry and industrial services – Austria

GRIMMA | DE: Engineering for the chemical process industry

EDL-LEIPZIG | DE: Refinery, petrochemical and chemical plants, modernisation, revamps

KIEV | UA: Gas and LPG plants
SEVERODONEZK | UA: Engineering – Ukraine

BUCHAREST | RO: Refineries, petrochemical industry, power and environmental facilities, general plant engineering – Romania

PLANT DESIGN ON A FIRM BASIS

“The combination of a SDA- and a Bitumen Plant can be a very cost-effective Residue Technology for Fuel- and Lubricant Refineries”



RESIDUE TECHNOLOGY. Solvent Deasphalting An economical and efficient solution for residues in refineries



EDL. Stricter environmental constraints and an upward trend in processing heavy, high-sulfur crude oils are reasons to look for an efficient solution for crude residues at refineries.

A solvent de-asphalting (SDA) plant combined with a Biturox® bitumen plant are capable of processing a variety of heavy residues completely to become valuable products, such as DAO (de-asphalted oil) and bitumen.

Based on proprietary tech-

nologies the Pörner Group offers a very cost-efficient overall solution for an ideally fully residue-free refinery.

At pilot plants for de-asphalting in Germany and Biturox® in Austria the optimal design can be found by process simulations. It is possible to test feedstock, determine product qualities, optimal process parameters as well as undercritical and overcritical operating conditions. (Rolf Gambert)

SOLVENT DE-ASPHALTING: TURNING RESIDUES INTO GOLD

LEIPZIG. A change in crude oil availability and stricter environmental requirements force refineries to look for new ways when it comes to residue processing.

Stricter legislation

It has been common practice to incinerate refinery residues from established conversion technologies, such as thermal and catalytic cracking mostly at power plants or sell it as marine bunker oils. According to new environmental standards effective from 2015 the sulphur content of marine fuel oil will be limited to 0.1 % (currently 1.5 %). Such stricter laws force the operators increasingly to run their plants residue-free.

Ecological Use

The combination of a solvent de-asphalting (SDA) and a bitumen plant helps fuel and lube-oil refineries to almost completely convert their residues into saleable products (de-asphalted oil and bitumen), and an efficient processing of heavy residues can even increase the value added.

Combining two processes

By combining a solvent de-asphalting (SDA) and a bitumen plant (Biturox®) the Pörner Group offers a highly efficient integrated solution. It is thus possible to utilize refinery residues almost completely.

As opposed to other technologies the solvent de-asphalting process involves comparably lower costs and can be run with different feeds (e.g. vacuum residue, vis-breaker residue, residues from used oil treatment plants etc.). The de-asphalted oil obtained can be completely converted into saleable products in the downstream conversion units. All modifications of the bitumen produced are high-quality commercial products for the refinery.

Complete Use

The test stands in Vienna and Leipzig can handle the entire technology chain for the specific case of application. An SDA plant can be optimized for the best possible product qualities of the DAO and the pitch alike. A Biturox® plant is arranged downstream of the SDA plant where the high-asphaltene SDA pitch is utilized for the bitumen production.

Besides an ecologically friendly utilization of many residues the refinery gets maximum flexibility when it comes to the selection of crudes. (Rolf Gambert)

SDA test stand

COMPETENCE CENTER LEIPZIG. A lot of research by EDL

LEIPZIG. EDL was commissioned by H&R to build a propane deasphalting facility as part of an integrated solution to process refinery residues.

On this basis EDL teamed up with the INC (Institut für nicht klassische Chemie, Leipzig University) to set up a test stand where the processing of

residues at different temperatures and pressures (=5 l, 30 to 300 bar – overcritical; 5 l, 30 to 50 bar undercritical) can be tested with various solvents, solvent quantities and in a multistage mode of operation.

Two autoclaves are available to determine optimal process conditions at reasonable cost.

The test results (equilibrium, process flows for thermodynamic and hydraulic design of the extractor etc.) become the input of process simulation for the design of large-scale plants. (Jan Schwartze)



SDA test stand in Leipzig

EDL ANLAGENBAU. Lubricant Mixing Plants Technology enables efficient production of lubricants

LEIPZIG. EDL as legal successor of EDELEANU GmbH is active in the field of lubricant refining (base oils, re-recycling of used oil, deasphalting, wax) Now, the portfolio also includes “Lubricant Mixing Facilities”.

By way of dynamic simulation EDL creates a model of a plant configuration based on economic figures that is tailored to the individual site and the local requirements of the market. A prior art, highly automated

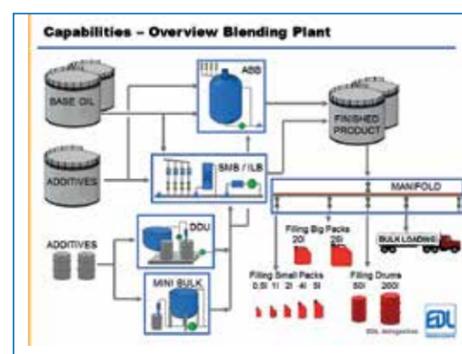
blending facility can produce a substantial number of different products just in time.

Large quantities of standard oils are produced by inline blending whereas specialty products for industrial purposes are produced in compact mixing units in just the quantity needed.

EDL lubricant mixing facilities are equipped with the latest components (distributor and go-devil systems, filling sys-

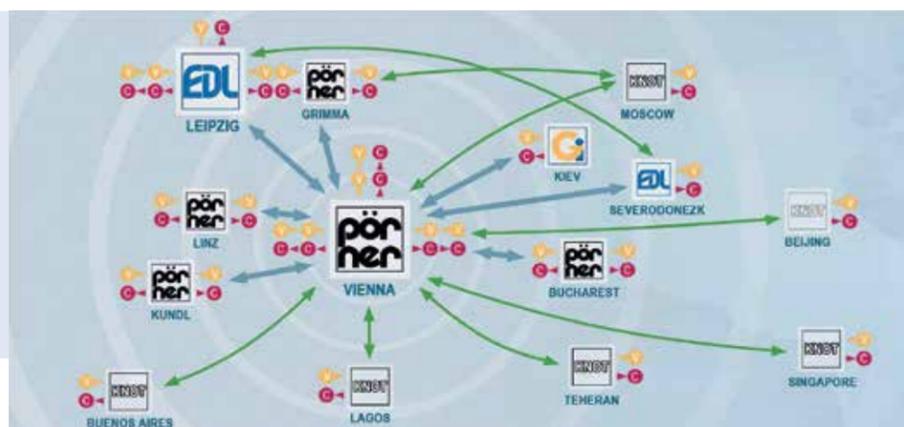
tems, automation based on recipes etc.) and therefore feature maximum variability at least possible cost of storage.

For detail information on the lubricant mixing technology visit our website www.edl.poerner.de (Gero Thalemann)



Process Scheme of a Blending Facility

A NETWORK OF ENGINEERINGCOMPETENCE



“40 years’ experience in plant construction - Your reliable engineering partner.”

Bioethanol plant general planning



Bioethanol Plant, Pischelsdorf, Austria

PISCHELSDORF. AGRANA Bioethanol GmbH put up the largest Bioethanol plant in Austria. There alcohol is produced out of agricultural commodities, and afterwards blended into petrol. As general planning contractor Pörner was commissioned with all related engineering scopes, like construction engineering, static, steel construction, processing plant equipment, piping including isometrics, EMSR, as well as site management and supervision.

After the short construction period of 15 months the plant was commissioned. Since 2007 four industrial projects were carried out by Pörner at the AGRANA Industrial Site.



AGRANA BIOETHANOLANLAGE

Investment: 125m Euro
Capacity: 210.000 TPA Bioethanol
 180.000 TPA ActiProt®, a high-grade GM free protein animal feed
Main raw material: 500.000 TPA grain (primarily wheat and corn)



Bioethanol Plant Pischelsdorf, Austria

High-pressure melamine plant

BOREALIS. Produced at 280 bar and 420 °C

1998 Pörner was awarded with the Basic and Detail Engineering for two Melamine plants with the new procedure set out by former Agrolinz (Borealis) in Linz and Castellanza.

Melamine can be produced with high-pressure (280 bar) and high-temperature (420° C) by this new process.

Special materials and equipment are needed for these extreme temperatures and high pressures. Therefore a high level of material-related knowledge and know-how was demanded by the participating engineers and specialists to design the piping, instruments and vessels.

Double jacket high pressure pipe systems were heated with molten salt (liquid salt for piping with high temperature demand).

During the detail engineering for the high-pressure procedure several research results of the research department were jointly implemented with Agrolinz.

Both plant were constructed almost identical in Austria and Italy.



High-pressure Melamine Plant Linz, Austria

BHP Hot Briquetted Iron

Hot Briquetted Iron Plant in Australia

VAI (VOEST-ALpine Industrieanlagenbau) constructed an Iron Briquetted Plant according to the FINMET® technology for BHP in Port Hedland with a capacity of 2m TPA iron briquettes.

Pörner made the calculations and drawings for the piping, instruments and apparatus of the “largest accumulation of pressure vessels in Australia” (John Crocker, Australian Mining Department).

System components, reac-

tors, containers, production assembly and piping are fixed on a steel framework, which is 100 m high. Pörner was charged with calculations for 16 reactors according to Australian standards, 17 different apparatus and about 20 piping systems.



Power Plant for the Wind

Fan center for Austria largest blast furnace



voestalpine

Voestalpine Stahl GmbH awarded Pörner the EPCM contract for the general refurbishment of the fan center 2, an important part of the project „Full re-treading Furnace A“.

A prerequisite for the furnace’s function is the continuous secure supply with fresh air. The main target: trouble-free continuous operation by high-level of automation and latest state-of-the-art technology during furnace campaign life (working period of 15 years).

Pörner did 27,000 engineering hours within three years.

The fan center 2 generally corresponds to a calorific power plant. But the steam turbine

drives a compressor instead of a generator to provide the furnace’s hot blast stoves with cold blast.

About 3,000 men and 450 subcontractors were involved by the retrofitting (scheduled for 105 days). The first blowing-in ran as planned and the blast furnace had the full implemented wind capacity.

Fan Center 2, Linz, Austria



3D scheme for the steel construction, 100 m height



Delivery of one reactor, 60 m height



BHPHOTBRIQUETTEDIRONPLANT

Capacity: 2m TPA iron briquettes
Reactors: 60 meter height

VOESTALPINE AG

The Austrian Technology and Industrial Group Voestalpine AG operates worldwide. The group is represented in more than 50 countries and consists of about 500 group companies and subsidiaries.

The core business is steel production and processing.

Modernisation of a Fertiliser- and Basis Chemicals Industrial Plant

BOREALIS. Pörner successfully finished major project at the Linz location



VIENNA. After decades of operation the fertiliser and basic chemicals plant at the Linz location needed a modernization through state-of-the-art technology in order to safeguard productivity for the future. In October 2010 Pörner Austria was contracted by Borealis for the engineering and implementation project at the Linz plant.

The most important parts of the fertiliser production, being the ammonia and urea plant, as well as the necessary utilities, were furnished with new equipment, components and new system controls.

Because of the significant project size the revamp was split into 78 packages respectively sub-projects, an enormous complexity for the engineering-, procurement- and installation

operations. In peak times the work force at site reached 350 people.

Borealis commissioned Pörner with the general planning and management (EPCM contract) of the project. The services included project management, basic and detail engineering, procurement and purchasing services, as well as site management.

Pörner also served as safety representative.

Although many of the works were performed in the operating plant, they were completed without any Reportable Incidents (accidents) - a formidable record.

Two successful turnarounds

Project high lights were both



turnarounds in summer 2012 and 2013. All intended erection and pre-commissioning tasks were executed within only a few weeks – a challenge for all contractors and subcontractors involved, but particularly for the project management and the coordinating project teams. Both turnarounds proceeded suc-

cessfully because of the careful planning.

Close cooperation between owner and contractor, and a high-level of flexibility are the important ingredients for the success of such an extensive rebuild. There had to be made decisions constantly together with the All interest groups,

project-, operation- and turnaround teams of Borealis, were challenged by continual decision making, time scheduling and work synchronization, and last but not least all 78 packages subprojects fell in line neatly.

The result

It was the largest contract Borealis had ever awarded to Pörner. All units of this complex project work as intended and produce successfully. This confirms the excellent cooperation between client, general planner, suppliers and subcontractors to elevate the fertilizer- and basic chemicals production units at the Linz location to state-of-the-art technology.

(Gerhard Vlcek)

Crudeoil Distillation Plant RD4 in Operation again

OMV. Modernisation of the main crude oil distillation plant at the refinery Schwechat



VIENNA. In April 2013 OMV Refining & Marketing GmbH (OMV R&M GmbH) entrusted EDL Anlagenbau mbH with two modernisation projects for the refinery in Schwechat.

1: „RD4 Program“

The crudeoil distillation plant 4 (RD4), one of Europe's largest ones, is the refinery's heart. With the aim to reduce energy costs and emissions, and after substantial preparatory work, the plant was modernized and equipped with a brand new residue cooling system within only 12 shut-down days. During those days, in 23 work shifts, the most important equipment was changed, some 140 tons of piping renewed and the control and instrumentation equipment of the affected parts replaced.

2: “Butamax Revamp SW”

Butadiene is an important raw material for the plastic industry and is mainly used in the automotive industry and tire production. Because of the strong increase of demand OMV decided to expand the butadiene production plant at Schwechat. To achieve the planned capacity increase six columns, three tanks and a compressor were modified, and 20 pumps, nine heat exchanger and three heat exchanger bundles replaced.



left: Crudeoil Distillation Plant 4, right: Butadiene Plant Refinery Schwechat, Austria



The shut-down time granted for these works was 26 days.

About 400 pipelines were partially newly laid with some 200 tie-in points in existing lines

In addition to the mechanical modifications approx. 400 new control and instrumentation elements were installed. Up to 260 persons worked on-site

to finish the extensive modernization work on schedule.

Competent planning

Pörner has executed several modernization projects for OMV in the last years. Also this time Pörner was entrusted with the basic and detail engineering, procurement of process plant equipment, as well as site management and erection supervision.

The design and engineering was realized in close cooperation between EDL and Pörner

Vienna. Detailed mounting schemes and operation charts were developed employing state-of-the-art software tools to optimize the shut-down periods.

The Pörner construction management met the deadline through close cooperation with the sub-contractors. The works were completed without any Reportable Incidents (accidents) and both modernised plants were handed over on time.

(Christian Birgfellner)

PROCESS PLANT MODERNISATION

Executing revamp projects (the modernisation of existing process units) is one of Pörner's core competences. Pörner fully develops and undertakes such projects out of one hand. Over the last years more than 20 revamp-projects were executed for German and Austrian refineries, petrochemical and chemical industries. In times where Europe sees hardly any new major industrial plant construction, revamp of existing process plant has proven to be very economical. For approx. 25% of the cost for a new facility, it is possible to reinstate an existing process plant by a to newest technology. Machines, apparatus and systems, instrumentation and automation are thereby replaced to optimize the product-output (quality and capacity) and to reduce energy consumption and emissions.

Pörner Linz designs Natural Gas Pressure Reduction Plant

NATURAL GAS. Borealis in Linz is the largest consumer in Austria



LINZ. Borealis Agrolinz Melamine AG awarded Pörner Linz the contract concerning a study for the revamp of the natural gas reduction plant at the facility in Linz.

Borealis Agrolinz Melamine AG is the largest natural gas consumer of Austria and produces 2 m TPA basic chemicals, such as melamine, nutrients and technical nitrogen products.

The Natural Gas Reduction Plant “Bau 180” is designed for the quantity of up to

70,000 Nm³/h natural gas, and reduces the gas pressure from 64 bar (max.) to 43 - 17 bar.

Pörner Linz developed several technical variants to achieve the highest possible degree of availability and extremely fast response time. Borealis opted for the exchange of all fixtures in the prime line (connection to regional gas net – preheating – safety shut-off valves – pressure reducing valves) and charged Pörner Linz with the basic engineering and the general management.

The reconstruction took place in the plant running, whereby secure operation was always guaranteed by installing a safe redundant circuit. For the multi-phase installation planning with six separate planned records for the removal and fitting PDMS was used.

In summer 2013 the project was finished on time and on budget, also owing to the excellent cooperation with the client.

(Eugen Gotter)

Interior view of the BOREALIS Natural Gas Pressure Reduction Plant Linz, Austria





We did

EDL's „Schwedt Expert Team“ completed and handed over the plant to PCK Raffinerie



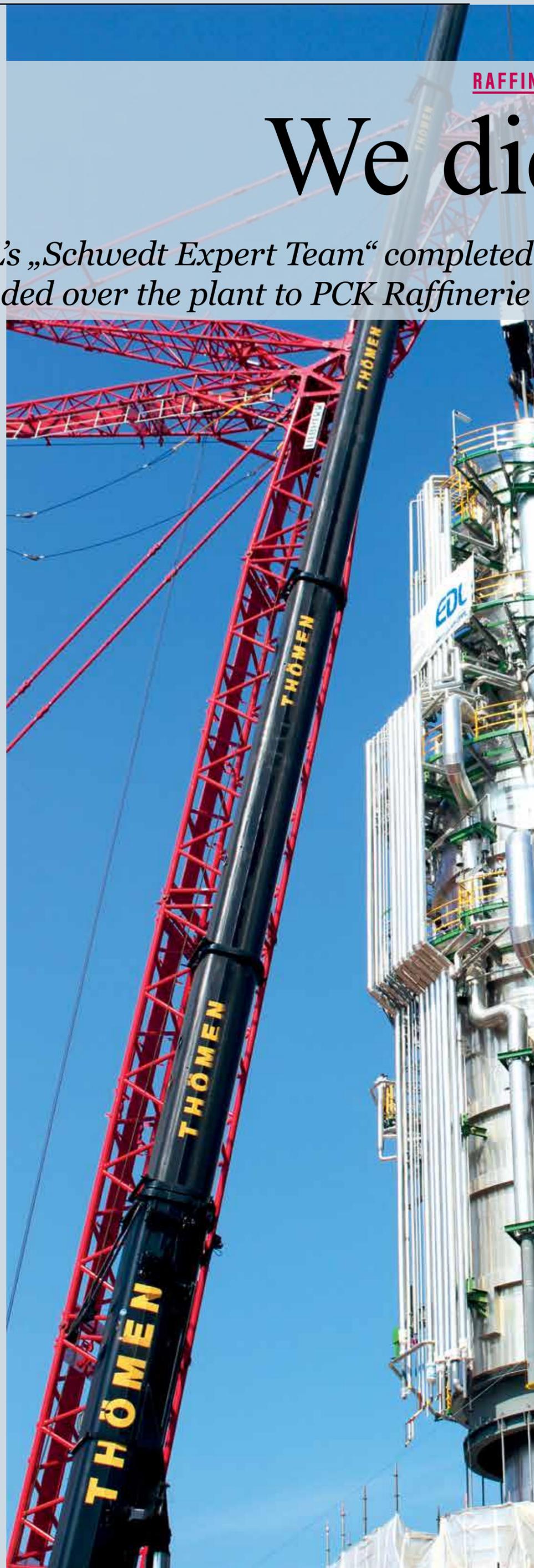
Christina Pöttsch and Horst-Günther Thalemann on 20.04.2014 shortly after 5:00 am: „Will it work well today?“



Have good reasons to laugh (f.l.t.r.): Horst-Günther Thalemann, Thomas Schulze, Shutdown project manager „Optimix13“ of PCK and a representative of the reactor supplier



The crawler crane shortly before application



The PCK RAFFINERIE SCHWEDT

has a staff of 1400. About 95 percent of the fuel for the capital city Berlin and kerosene for the airports of Schoenefeld and Tegel come from PCK.

About 11 million tons of crude are processed every year. The portfolio of fuel products is complemented by propane, butane, bitumen, sulfur, sodium sulfate, propene, ETBE (from bioethanol), benzene, toluene, xylene and terephthalic acid.

In 2004 PCK was the first refinery in Germany starting production of an octane booster based on biogenic components (ETBE plant) that can be attributed to the group of biofuels. Two years later a second plant became operative where PCK also incorporates biocomponents in petrol components by chemical processes – a light gasoline etherification plant.

ERIE

and it!

on schedule a refinery shutdown project GmbH to the customer's utmost satisfaction.



Heavy Equipment of use during mounting



Reactor in suspended state

LEIPZIG. For the fifth time in a row (2001, 2004, 2007, 2010 and 2013) EDL's team of "Schwedt" experts in Leipzig headed by the project manager Horst-Günther Thalemann completed on schedule a refinery shutdown project and handed over the plant to PCK Raffinerie GmbH to the customer's utmost satisfaction.

Higher Flexibility of the Refinery Operation

"OPTIMIX13" time had come at the Schwedt Refinery in 2013. It meant the multisectoral shutdown was just around the corner during which it was not only the equipment that needed to undergo the regular inspection but also several units were to be optimized. The aim of this shutdown was to condition the refinery for the tough competition in the refinery sector. To this end EDL was commissioned by PCK to deal with two core areas of the refinery – the vacuum distillation unit 3 and the FCC unit. Both units are located at PCK's cracking complex. The task of the vac-

uum distillation unit 3 was to optimally design the furnace in terms of energy efficiency and increase the yield to get more end product for conversion.

Therefore the vacuum distillation unit 3 was provided with a new vacuum column and the furnace retrofitted and equipped with new burners with forced air supply including flue gas pre-heater. As part of this upgrading the vacuum column was converted to the Deep Cut mode.

With a new reactor in the catalytic cracker (FCC) PCK is moving towards an elevated LPG output, i.e. propylene, thus responding to the shrinking petrol market in Germany and Europe.

Tight Schedule and Logistic Challenges

Not more than 21 days had been scheduled in spring 2013 for the tie-in of the new equipment and components, and EDL managed it despite the doubts raised by many in Europe about the feasibility.

Crawler cranes were em-

ployed for this job with two of these large-size cranes running in the immediate vicinity. Both the crane erection and the installation of equipment in connection with all other construction work and tie-ins in neighbouring areas constituted a major logistic challenge for EDL's PCK team given the short time span. Sometimes it was a matter of few centimetres only. The tasks were solved brilliantly by the team.

Accomplished at last

On a cold rainy Friday evening the shutdown project manager Thomas Schulze was notified by EDL Leipzig: "Vacuum distillation unit mechanically complete".

"My boys and girls and me can say loosely based on Goethe: "We had been there", stated the EDL project manager Horst-Günther Thalemann with relief after the successful accomplishment of this mission.

(Horst-Günther Thalemann) ■

UKRAINE

EDL Engineering in Severodonezk Joint Venture EDL Engineering for process plants

LEIPZIG. In the beginning of 2012 Pörner founded the Joint Venture "EDL ENGINEERING" for the engineering of process plants. Besides the subsidiary GAZINTEK, Pörner has now at its disposal a second enterprise in the Ukraine.

Operate flexibly

The Joint Venture EDL Engineering was founded in Severodonezk, to operate more flexibly on the Russian market. The staff has excellent language skills and is particularly exper-

rienced in refinery technology as well as project management.

Competent service provider

EDL Engineering is mainly focused on providing documentation for authority engineering, process and assembling technology, complete C&I engineering packages as well as expert assistance in various disciplines.

In addition, the Joint Venture shall support EDL Leipzig, Pörner Vienna and Pörner

Grimma in Russian projects, if required.

The Ukrainian colleagues have significant experience and know how in the Russian market, Russian standards and regulations.

In the past and also presently several projects are being executed jointly for most prestigious Russian refinery clients.

While at present we call in external support in case of working large projects in the future more professional engineers shall be employed. (Roland Ludwig)

To present EDL Engineering Services a folder was published recently in the Russian language.



The EDL Engineering Team in Severodonezk



RUSSIA

SRO-Certificate for Pörner Important for the Russian market

VIENNA. The SRO-Certificate is indispensable to sell and carry out projects in Russia.

A building and engineering contractor is required to be member of a professional association – one of the so-called self-regulation organizations (SRO) - to succeed on the Russian market.

One foundation of the SRO certification is regular training tailored ideally to the individual disciplines and the requirements of future projects.

The Pörner Group arranged one of the biggest training courses in the company's history for the extension of the Russian SRO-Certificate for employees from Vienna, Linz, Kundl and our colleagues from the CIS.

Participants were made familiar with laws, standards and technical guidelines that are essential in particular in planning and design, and its documentation, and for industrial safety. For new projects it is absolutely essential to give due regard to the applicable Russian laws and standards from the very beginning, i.e. as ear-



ly as in the bidding phase. The 'full' SRO-Certificate enables the Pörner Group to implement projects worth over 300mn rouble. Also EDL has been granted the SRO-Certificate for the execution of engineering services in Russia.

We should be aware, however, that no certification and training guarantees the smooth flow of projects, and we still appreciate and need the close cooperation with our CIS subsidiaries, not least for the local know-how.

SRO Training in Vienna



Russian Language Course for EDL TRAINING. EDL employees receive Language Certificate

LEIPZIG. Last autumn EDL started a Russian course. Some of the employees met once a week to learn Russian.

Most of the participants once studied Russian at school or university, the long-ago skills, however, needed a brush-up.

The main aim of the course was to re-vitalize former knowledge, learn new vocabulary and improve oral skills. Under the direction of the experienced native teacher, Margarita, who did not only teach linguistic aspects with creativity and commitment but also dealt with geographical, historical and civil issues, the participants crammed grammar, practiced



The Russian Course at the „Jolka Party“

listening and reading comprehension and learned new expressions.

And the reward for all the hard work was a proficiency cer-

tificate of step A 1 and A 2 resp. according to the European level of competence, and due recognition within the company. (Ulrike Fischer)

«Пёрнер» becomes «Пернер»

COMMUNICATION. The Cyrillic notation of Pörner changed

Interesting at least for all Russian-speaking (also for one or two "ingenuous") employees, that we changed the Cyrillic spelling of the company name from «Пёрнер» to «Пернер» last September.

The background of this rather far-reaching decision is that the Russian letter "yo" - "e" with two jots - was equated with "e" in 2009. Therefore the "ë" has been almost completely replaced by "e" in official documents and the press.

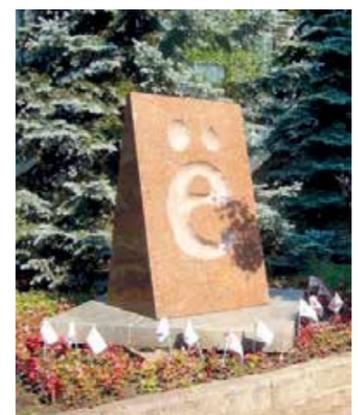
There are several reasons for our decision: On the one hand we had to use «Пернер» in our contracts for quite some time which led to problems quite often. In addition the "ë" often appears as special character instead of a letter in email correspondence, and thus leads to confusion when it comes to the company name, products etc. Last but not least we assume that the awareness of the company name without "ë" as a

trademark will be much better on the Russian market.

That's why we will do without "ë" throughout the organization and standardize the spelling and use «Пернер» and «Пернер Группе» respectively. There will be little effect on the pronunciation because the "correct" intonation will always be clarified in personal conversations.

The history of "ë"

The poet Nikolai Karamsin introduced this letter in 1797 because it was part of so many surnames in his region. Karamsin was born in Ulyanovsk - it is no Potemkin village (do you hear the "ë" ?) it really exists. It is located near the Volga River, about 700 km west of Moscow. Its former name was Simbirsk and it was renamed in 1924 in honour of the revolutionary leader Vladimir Ilyich Ulyanov (Lenin) who had been born



The Monument

there in 1870.

And Ulyanovsk memorialized this spurned letter.

Nonetheless the run of time cannot be stopped. Every language keeps developing. Even though we understand very well not only the language but also the mentality of the Russians we have to move with the times. Yo?



Process Plants for Russia

CORE COMPETENCE. *Plant engineering by networking with Russian partners*

VIENNA. Russian companies need modern processing plants for a successful support of the Russian economy.

Since its foundation, the Pörner Group is engaged in Bitumen- and Chemical Plants Engineering in Russia and countries of the former Soviet Union. The conditions for plant engineering have changed significantly in this region during

the last twenty years:

Today the larger projects are developed, designed and realized in close cooperation together with Russian investors, engineering departments and executing contractors.

The Pörner Group is focused on the provision of licenses and



technologies, as well as high-quality engineering and the supply of first-class equipment. For this Pörner is committed to developing concepts for economical operations of industrial plants, to efficiently preparing authority documentation for the state expertise (building per-

mission) as well as to observing Russian standards and certification directives.

Projects as well as clients benefit from many years of experience, that Pörner has developed in building industrial plants under extreme climatic conditions and an extensive knowledge about transport logistics, to provide equipment punctual on site. (Albert Traxler)

PÖRNER GRIMMA

Formalin competence center

EPC-contract partner for a formalin plant in Gubakha



GRIMMA. Pörner Grimma has been awarded an EPC contract and performed the authority engineering, basic and detail engineering, project management, procurement and supply of the entire equipment, transport, site supervision, commissioning, documentation and training.

Pörner executed the project in close cooperation with Licensor Dynea, who provided the process design and advised

on the process equipment as well as on the PCS configurations.

As usual in the Perm region excavation and solid construction work started in May after permafrost thawing. Installation work was executed mainly in the winter by -20 up to -30° C and snow covers with a depth of up to one meter. Construction was finished on schedule in springtime, and the plant was commissioned in July suc-

cessfully and trouble-free after some tests and optimisation. Since then the formaldehyde plant has been running in continuous operation.

Owing to the successful implementation Pörner was awarded a follow-up contract for a hexamine plant in Gubakha. (Gerhard Bacher)



Formaldehyde Plant in Gubakha. OAO Metafrax is the largest producer of methanol and its derivatives in Russia.

The Biturox® Plant in Nizhnekamsk. TAIF-NK is the most important oil- and gas enterprise of the TAIF-Group in Tartastan.



BITUROX®

Biturox® technology for Nizhnekamsk

Pörner Vienna realised a Biturox® plant for TAIF-NK



VIENNA. Pörner Vienna has been commissioned by TAIF-NK with the construction of a Biturox® plant in Nizhnekamsk. In addition to the licensing Pörner also performed the basic and detail engineering, procurement and supply of equipment, as well as site supervision.

Industrial and road paving bitumen is produced in two reactors with a capacity of 400,000 TPA.

High-quality bitumen reduces the building and maintenance costs for road construction. In spite of reduced layer thickness of high-quality bitumen the road's service life is

increased significantly.

The Biturox® technology enables refineries to transform residues into high-quality road paving bitumen.

Up to date Pörner Vienna has constructed six Biturox® plants in Russian refineries. (Christian Opitz)



Pörner specialists fixing the reactor on-site

Reconstruction of an AWT Plant at the Refinery in Moscow

DISTILLATION. *EDL performed design engineering for the comprehensive modernisation*

LEIPZIG. In autumn 2012 Gazprom Neft-MNPZ Cooperation awarded EDL Anlagenbau Gesellschaft mbH, Leipzig a contract for the detail engineering for refurbishing the atmospheric and vacuum distillation plant ELOU-AWT-6.

This project is part of the refinery's first stage of the modernisation program to increase

industrial safety and to meet the strict environmental regulations at the Moscow refinery. The project is going to be finalized in Q4 2014.

EDL prepares the project and work documentation for the refurbishment.

The scope of work is divided into several work steps and is expected to be completed in

cooperation with an Ukrainian Engineering Institute by mid-2014.

The project documentation had to fulfil the state expertise requirements in an extremely short timeframe.

All the more the EDL team is pleased, that the state expertise was granted without additional conditions and the implemen-

tation permit was issued.

Now the detail engineering followed, and the main subject of step 2012 was the stabilisation circulation, which provides the raw material for another modified unit. This part was implemented during system turnaround in autumn 2012.

The second step is to be realized in autumn 2014 with two mainly ecological and economic targets: energy optimisation and emissions reduction.

Besides, a large number of worn process parts will be replaced in the course of the refurbishment. (Peter Sonntag)



The fuel refinery JSC GAZPROM NEFT MOSCOW is market leader in the production of high octane fuels like gasoline, diesel and kerosene. The refinery also produces road paving bitumen, fuel oils and liquefied petroleum gas. The 12.15 million tons of crude oil processed per year, satisfies 40% of the Moscow region's local demand. With its enormous process capacity the Moscow refinery is among the ten largest refineries in Russia. At the moment a huge refurbishment and modernisation project is executed, which is planned to be finalized in 2020. The new plants for catalytic cracking and light naphta isomerisation meet Euro5 quality standards.



The Refinery in Moscow

PÖRNER BITUMEN PACKING SYSTEM

Cold bitumen logistics made easy

The Pörner Bitumen Packing System simplifies the supply with road paving bitumen

VIENNA. Supplying road builders with bitumen is very expensive because of the costly logistics. The Pörner Packing System is an ideal alternative because it provides an integrated solution for the storage, transport and sale of cold bitumen.

The Pörner Bitumen Packing System enables a cooling and packing of bitumen of the grades 50/70 PEN/PEN and 70/100 PEN/PEN resp. into dedicated containers.

This simple packing system enables refineries to produce, store and sell bitumen at any time, any place in the world.

It is thus possible to supply bitumen at reasonable cost, from small quantities for local needs through to hundred thousand of tons for entire countries.

To pack bitumen and make it ready for use again (heating), three modules are needed:



1. The Pörner Bitumen Bag™

Pörner Bitumen Bag™

The bag being a self-supporting container consists of two different plastic films. Liquid bitumen can be filled in and when cured it can be stored for up to 12 months. Shape, size and filling weight of the Pörner Bitumen Bag™ (approx. 1,000 kg /bag) are designed for an optimal use in terms of economy.

The bags are suitable for every conventional means of transport (standard trucks, 20' containers, rail), can be easily

stored, loaded and carried to any place in the world. The prefabricated bags come in large numbers in containers and therefore need little space for storage.

Cooling & Packing Unit

This filling station is designed to cool down bitumen to packing temperature so that the Pörner Bitumen Bags™ can be filled safely and efficiently. Filling is a fully automatic process where the exact quantity of each bag is recorded by a com-



2. The Pörner Cooling & Packing Unit

puter (approx. 1,000 kg bitumen) and documented.

At two modules up to 10 tph bitumen can be filled. If run continuously, the annual capacity of a filling unit is 80,000 mt. The filling system comes as prefabricated modules and is assembled at site.

High-Performance Melter

The mobile melter was designed by Pörner to melt the bitumen at local terminals. A special melting grate (Pörner



3. The High-Performance Melter

patent) was designed to melt bitumen in a minimum of time (up to 4 mt per hour depending on the climatic conditions). The bitumen can then be filled into truck tanks or used at site directly.

The high-performance melters come as prefabricated modules with integrated burner, hot gas system, melting grate, collecting tank, pumps etc. They are mobile and can therefore be used where needed.

(Michal Blazej)

بيتومينا
BITUMENA

Bahrain: A production hall with a space of 5,000 m² (the size of a soccer pitch) houses the Cooling & Packing Unit with four filling arms and an interim storage area for the packed bags.



Bitumen for the Whole of Russia

Pörner cold bitumen logistics for all weather conditions

VIENNA. In spring 2013 LUKOIL, the renowned Russian oil and gas producer, ordered a Pörner Bitumen Cooling & Packing Unit (CPU) for its refinery at Nizhny Novgorod. After a very short construction period the unit was put into operation in December.

Cold Bitumen Logistics in Russia

Lukoil opted for the Pörner Bitumen Packing System because

of the following advantages: It can be run safely all year round even at lowest temperatures. Once in bags and cold the bitumen can be stored over a long period of time and taken to any place in the world. It is thus possible to meet the growing demand on the local market in summer and have sufficient quantities available for export.

The Packing System

Through pipes the bitumen is

carried to the filling stations where it is filled into Pörner Bitumen Bags™ while being liquid. The filling system having a total capacity of about 20 mt per hour is fully operative at outside temperatures above and at 30°C below zero.

If run continuously, the filling system supplied by Pörner can fill up to 480 mt bitumen per day into Pörner Bitumen Bags™.

(Andrey Siletskiy)

BITUMENA

Bitumen for Africa

Economic development needs proper roads

VIENNA. MENA Energy headquartered in Dubai/United Arab Emirates and Pörner signed a contract on the construction of a Pörner Bitumen Cooling & Packing Unit. The subsidiary BITUMENA runs a packing line in the Bahrain Logistics Zone right next to the new commercial Khalifa bin Salman port.

This location is a logistic hub for the North African, In-

dian and Asian markets. It is the first time that bitumen can be obtained from a Gulf state. In February 2014 the plant was put into operation with an annual capacity of about 150,000 mt.

It is now possible to supply Africa with high-quality paving bitumen (straight run 60/70 PEN/PEN) at reasonable cost.

(Mark Seper)



Nizhny Novgorod: 480 tons can be packed daily by continuous operation. At the roofed storage place the packed bags are stored temporarily to cool down.



A modern Conference Center for EDL

SERVICE. Intensive communication with customers and partners at the EDL headquarters in Leipzig.



LEIPZIG. Projects growing in scope and the global business activities make it necessary to hold meetings with many attendees. That's why it was decided to convert rooms at Bürocenter Lindenthal into a conference area.

To this end new partitions were put up, the cabling re-

placed, new sanitary equipment installed and a roofed glass corridor built extending from the reception to the conference area.

Two meetings rooms for 12 persons each, two larger conference rooms for 20 persons each that can be changed into a large room are now available. All

rooms are air-conditioned and equipped with the latest com-

puter technology.

Grand Opening

In June 2013 EDL invited all staff including external staff, former employees and tenants of this office building to join the a summer party and admire the new premises.

Peter Schlossnikel, Managing Director of the Pörner Group said in his opening ad-

dress: "I am very glad about the new, imposing premises for EDL that will be especially useful in view of the numerous meetings with our German and foreign customers.

The new premises were favorably received by the guests who took the opportunity to enjoy the opulent buffet and live music there.

(Ulrike Fischer)



New Species discovered?

BIOLOGY. A very special creature was discovered in Austria in the underground of a refinery.

VIENNA. Just recently an unknown species was discovered at refinery premises. From time to time it surfaces, preferably at sewer covers. Its habitat is the sewerage labyrinth extending below process plants. One or other of these specimens have also already been sighted at office containers of the local Pörner site management. It has been classified as "Homo Rattus Cisternus" or tunnel rat.

The "Homo Rattus Cisternus" belongs to the species of Pörner engineers. This species has been a native resident of the relevant territory for years. It works closely with maintenance team and is in charge of the rehabilitation of curbs.

Just recently it was commissioned with the evaluation of the cooling and raw water system in preparation of an inspection and renovation scheme to be worked out for the years to come. For these activities due regard must be given to the strict safety regulations of the refinery. A tunnel may only be entered after measurements have shown freedom of gas. This special task has been assigned to the "Homo Rattus Cisternus". It is by nature most suitable to do this measurement for the protection of its fellow species.

It has got rugged rubber boots and resistant protective clothes to protect against harmful gases and smells. Its distinguishing marks are the tight gas mask and a Pörner hard hat and a portable LED light to find its way around in the darkness

of the labyrinth.

In case of an encounter don't be afraid. Despite its wild look the "Homo Rattus Cisternus" is a friendly creature and like all fellow-species interested in its environment and very sociable. (Margot Simonis)



Homo Rattus Cisternus



Video Conferencing by Pörner and EDL's

IT. Vienna, Linz, Grimma and EDL Leipzig visual cross-linked

VIENNA. It is now possible to hold conferences with customers, partners and suppliers who have got such kind of equipment. Equipped with performance cameras, room mikes and large screens you sit "at one table" and

discuss current issues without meeting face to face. Documents can be looked at and processed interactively.

This new system is to replace some travels abroad if not all, which is beneficial for the work

and the environment alike.

We are looking forward to meeting you soon also via this channels at one of our sites.

(Richard Heß)

Pörner-IT-expert Johannes Schipper at a videoconference



SPORT

Snow Fun and Après-ski Party!

Last March Austrian Pörner employees traded their desks for sunglasses and skis at one weekend

VIENNA. This year in March the Austrians exposed themselves again to the snowy climes. The number of 113 enthusiasts looked like a new record.

All skiers agreed: the location was well chosen on the Katschberg mountain at an altitude of 1,600 m in sunny Carinthia.

While some were racing downhill the non-skiers and young families indulged in the hotel amenities in keeping with the motto Boredom is unheard of. They had a lot to offer for body and soul: a 2,000m² spa to splash around and leave one's cares behind as well as care and entertainment for the kids.

The annual skiing outing with the family is an integral part of Pörner's corporate cul-

ture. Sharing leisure activities does not only strengthen the relationships among people but enhances team spirit Pörner places much value on. (Herbert Benda)



LAST MINUTE

Austria's performance was successfully not only at the ESC 2014 in Copenhagen but also at the ESC 2014, the Engineering Sailing Cup, in Croatia. The Pörner team won sovereignty this year's sailing competition at the Croatian coast. The crew under command of skipper Eugen Bötter won three of five routes and with it the overall victory. Congratulations!

THE PERFECT PROJECT 2014

VIENNA. The industry's increasing requirements have led to substantial improvements in terms of project structuring, methods and organization of work in process plant engineering.

A network in plant engineering

Process plant engineering has always represented an industrial division highly standardized and with high organization level. In the last few years globalization with international division of labor, modern communication methods, computer based engineering and production systems effected a boost on efficiency and quality across virtually all engineering sectors.

Modern process plant engineering requires a close cooperation between an engineering company and its client, as investor and operating company, as well as with all suppliers involved, like construction and assembling contractors together.

For Pörner it means the assignment of most experienced

everyday work it must be made sure that changes impacting the contract are decided and confirmed by the project management.

An up-to-date documentation management system provides all data and information in real time to all parties involved in the project (employees, customers, suppliers and construction contractors) whenever needed for their workflow.

Sanctity of contracts

Plant engineering contracts have a much larger scope today compared to that 20 years ago. Numerous legal attachments, directives and specifications have to be taken into consideration and observed by all parties actively involved in the project.

All the more the success depends on persons able to keep things going beyond the mere writing in a pragmatic and practical manner and settle is-

latest generation is used with a great value added, such as:

- Integrated project databases where all correspondence, descriptions, specifications and drawings are available at any time;
- Software modules for a detailed process simulation;
- General design tools for individual disciplines, such as civil/structural design from stress calculation through to workshop draw-



Investment worthwhile for the future

ings or the entire electrical and I&C design.

The Pörner Group is equipped with powerful 3D design systems (PDS and PDMS) where all data are stored in a smart manner.

Added value has been created in all these tools of the latest generation: in the 3D systems it is possible, for example, to bring in inventory through photogrammetric pictures. The construction sequences can be pre-planned exact to the centimeter when it comes to conversions.

Individual software modules are increasingly networked with project controlling, scheduling and cost control.

Only engineering companies with a certain size – like Pörner – are able to afford, implement and maintain continuously such complex systems.

State-of-the-art equipment

It is one of the Perfect Project Philosophy, that a process plant will be equipped uncompromisingly with the newest and best worldwide available components. This requires profound market knowledge and experience for the various special departments of an engineering company. To optimize a plant's capacity and persistence it is worth getting involved all specialists for equipment and automation systems into the basic engineering from the beginning. Established and global manufacturers offer effective and equivalent guarantees, that their components will be disposable for decades.

Investing into the future

Especially in times of global competition the investor must

“We build plants with the decisive extra in innovation, flexibility and productivity.”

be aware that a high technological quality, adherence to schedule and safety in plant engineering applying the latest methods by trained professionals have a price.

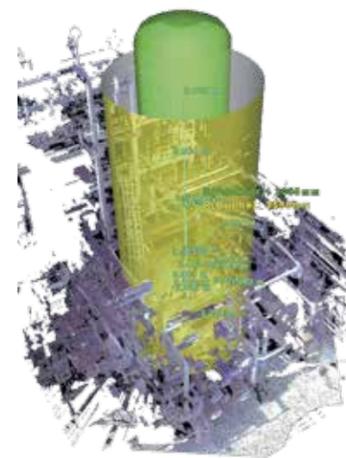
In return the investor gets a technically optimal plant that is completed smoothly, without complications, on schedule and within the budget and is highly productive from the very beginning. So, the investment into a good organization and planning pays off for the investor with interest in less than no time.

A most recent impressive example in this respect is a conversion project undertaken by Pörner and EDL in Austria for one of Europe's largest oil refineries.

We therefore call upon our partners and customers: Use the entire range of Pörner services, our creative, organ-

izational and technical performance. Please provide sufficient budgets for the project management, control and engineering execution in your own interest. You create yourself a basis for many years of smooth operation for your process plant established by Pörner.

(Michael Volkmann)



New software solutions enable to visualize plants into virtual reality.



engineers and innovative specialists forming a project team tailored to project concerned: all-rounders and specialists under the supervision of a proactive and communicative project manager.

Fluent Communication

In project execution the communication via electronic media is a great challenge. A clear normative and decision-making structure has to be maintained during the entire lifespan of a project. In the past information was exchanged by letter. It was easy to channel all major communication through the project management. Even today in the age of emails being part of

issues that occur willy-nilly amicably.

A Competent Project Team

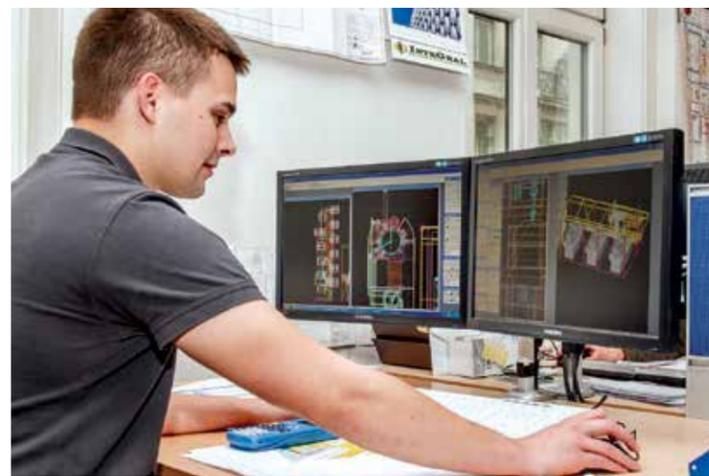
To be up to the enormous challenges, a project team needs a good mix of creative, controlling and executing folks complementing each other in their skills. Pörner as a medium-sized company is well-placed in this respect compared to other engineering contractors.

This way of working and corporate culture has made Pörner one of Europe's most all-round and flexible engineering companies undertaking process projects of all kinds for decades.

Latest Software Tools

The work has remained the same, but today it needs to be done faster and in a more concentrated way.

In 2014 the qualified engineers have the latest tools at their disposal for a perfect project. In virtually all areas and disciplines software of the



Dear Readers!

The Pörner Group will be present from May 26 to 29 2014 at **NEFTEGAZ 2014** in Moscow. Meet us in hall 2.1 / booth C07!

