INGENIEURS-BLATT

NR. 01/11 | PUBLISHED BY ANDREAS PÖRNER | AUTUMN 2011

Turn-Key Process Plants

efficient - expeditious - economic

Pörner hands over the Biturox® Plant to SAMIR (Morocco): constructed turn-key with tanks and filling stations - on schedule and on budget - in July 2011.

Meeting the signs of the times

Economy flourishes – in particular the export and investment goods sectors.
However, what changes have we gone through in plant construction in this decade?

Our era becomes more and more short-lived. This results in an increasing volatility of the markets. The impacts of the political changes in the Arabian Region as well as the natural disaster in Japan are still not estimable for the international process plant construction industry.

Shorter forseeable life cycles of products and related investment projects are forcing constructors to realize industrial plants in a record-time and extremely cost-effectively.

Nowadays, the decisions to construct plants are made on short-term by the investors. Shorter life time of products requires a rapid adjustment of production units.

New products are developed permanently. The market demands for more modern, light-weighted, resistant, thermo-stable and recyclable basic materials. Therefore fully automated as well as eco-friendly plants are needed.

Due to globalization a specialization in niche products is essential for the European industry even in energy generation and chemical processing. This is not only a strategy for survival but in fact the motor for innovation and the steady development of the European culture sphere.

Up-Scaling and Revamps

The enterprises of the Pörner Group are involved in the ongoing development of new processes – e.g., by up-scaling of pilot plants to initial commercial installations. In the following these can be licensed internationally and constructed at many locations.

In addition, our group has specialized in revamps. With an investment of approx. 10% to 20% of the original costs existing, already fully depreciated process plants can be renovated to a large extent. Thus the product quality and yield can be improved – in parallel to an optimization of the energy consumption, and automation and safety of operation.

Revamps in running industrial complexes require special know-how. As Pörner offers all engineering services out of one hand, specialized engineers are available directly on site, which is a pre-condition for a successful revamp.

Large international companies with their detailed engineering compartments overseas have difficulties to provide these local services.

Concentration and Rationalization

Due to concentrations at the manufacturers, the prices of plant and machinery equipment increased vehemently. The same applies to civil construction and erection work. The number of European vendors is less than 20 years ago.

Likewise the number of engineering companies for the process industry also reduced drastically.

After the recent boom years the refineries' margins declined. The resulting pressure on time-limits and investment costs force us - the engineering contractors - to work even more efficiently. This in turn helps to strengthen our competitiveness on the international markets.

New Challenges

Each year investments of over 50 bn Euro are made in European process plants. The producers and operating companies – maintaining less own personnel capacities - assign more and more tasks and duties to engineering contractors.

A resulting trend is to place project contracts on turn-key basis. The turn-key realization of a plant offers advantages for financing and in many cases shorter construction times, but also implies some hindrances (see page 8 "Turn-Key - an Intelligent Alternative").

The Pörner Group meets all these challenges with new ideas, process developments and modern working methods. However, one thing will never change: our main principle lived for 39 years - to provide our customers with our full creative work power as engineers for the benefit of the society.

Andreas Pörner
Peter Schlossnikel
Managing Shareholders

Our world's future depends on engineers' liability.

CONTACT

Pörner Ingenieurgesellschaft mbH
Hamburgerstrasse 9
1050 Wien, Österreich
Tel.: +43(0)505899; Fax: -99
Email: vienna@poerner.eu
www.poerner.eu

Publisher: Andreas Pörner, Hamburgerstrasse 9, 1050 Vienna, Austria | Telefon: +43(0)505899, Fax: +43(0)505899-99 | Email: vienna@poerner.eu | Independent coverage of engineering projects of the Pörner Group | Editorial: Margot Simonis | Layout and type: Sofie v.d. Fecht | Print: Citypress, Hormayrgasse 53, 1170 Wien

Personal affairs


DI Peter Schlossnikel

Vienna (Peter Schlossnikel). In 2012, Pörner is going to celebrate its 40th anniversary. Founded in 1972 by Kurt Thomas Pörner, the company developed within four decades from a small engineering office to an international player in process plant construction.

Our group of companies act as partners of the Austrian and German industry and many other European customers. We enjoy an established reputation as market leader in an interesting niche: Plants for production of road bitumen in refineries. With more than 2,000 projects realized within the group, we are well positioned for the future with our experiences and outstanding references. A reassuring outlook: We see a worldwide potential of some 20 to 30 plants of medium size that the group can design and supply over the next years.

We operate subsidiary companies in Leipzig and Grimma (Germany), Kiev (Ukraine) and Ploiesti (Romania) and branch offices in Vienna, Linz and Kundl (Austria), with a total number of more than 450 employees. Engineers and professionals specialized in the design of process plants form the backbone of the Pörner Group.

In recent years, the number of employees on payroll has remarkably extended and rejunvenated. It is very positive that the traditional image of the engineer profession as a domain of males is changing: engineering companies as employers are obviously getting more attractive for the female gender. The combination of experienced elder and dynamic younger staff will - together with flexibility and efficiency - ensure our competence in the plant construction of the future.

Our elementary corporate principle is to provide first-class engineering services to the process industry-out of one hand and with that "decisive extra" of innovation and commitment. Thus the name Pörner has become a synonym for reliability - especially when new innovative process ideas are to be transformed into productivity. ■

Peter Schlossnikel
Managing Shareholder
Pörner Austria


The Pörner Group Headquarter in Vienna

BITUMEN PLANT CEPSA-SPAIN

Modern products produced eco-friendly

Huelva (Christian Filz) CEPSA is one of the leading oil companies in Spain. Last year the demand of bitumen amounted to over 2,5 m TPA on the Iberian Peninsula. CEPSA produced approximately 1,3 m TPA. The bitumen is marketed by the subsidiary companies PROAS and CEPSA Portugal.

Economic construction and fast renovation are – compared to concrete road surfaces - the main criterion for important asphalt roads with high traffic loads.

On the Iberian Peninsula roads are often operated by non-public institutions. Therefore both the costs of erecting as well as the "Total Ownership Costs" are to be considered over in the long run. In this light the demands of quality and long-life-cycle of roads have increased.


Biturox®-Plant in Huelva

New Spanish Standards
For the lifetime of a road the quality of the binding agent bitumen is - beside the design and quality of construction – the most essential factor.

On these challenges – and on the increasing prices for oil products - the Iberian construction industry reacted with new ideas and developments.

The result: Roads are to be paved today with reduced layer thickness, by using special bitumen qualities. Therefore the quality of bitumen-standards was raised considerably in Spain, mainly the parameter PEN Index and Aging (according to RTFOT).

The increasingly used moderate bitumen grades in PEN range from 25 to 35, show high resistance against rutting at high temperatures and have a high fatigue-resistance at low temperatures as well as increasing traffic volume.

Biturox Plant for up-to-date Products
At the beginning of 2009 based on these facts CEPSA decided to invest in a new Biturox® Plant in their refinery in La Rabida nearby the city of Huelva, Spain.

The plant's nominal capacity amounts to 350,000 TPA and is used solely for the production of road paving grades. It is operated continuously and fully automated via the refinery's distributed control system.

Biturox® is the only process that can produce modern special grades economically at low costs, without expensive additional specifications (like catalysts, additives, polymers) only by oxidation with atmospheric oxygen directly in the refinery. The Biturox® Process allows for the application of a big variety of crude oils preferably used by international refineries.

Thus Biturox® does not only improve the bitumen qualities, but enables the refinery to produce valuable white products with optimum yield at the same time.

Key Components supplied by Pörner
Pörner's scope of supply for the CEPSA bitumen plant in La Rabida implied provision of license, basic engineering, detailed engineering of reactor and off-gas systems and supply of core components such as Biturox® reactor, three-stage agitator and the total package of off-gas treatment including condensate and heat recovery.

The La Rabida Plant is technically on the highest level with its high-performance turbo-reactor for continuous bitumen production under pressure, energy optimization and all features of protecting the environment.

Quality from the very beginning
Pörner accomplished the commissioning of the unit in Spain in the record time of 6 weeks after a design phase of 15 months and erection period of 12 months.

Though the customer provided other raw materials, than primarily used in the pilot tests for the design of the process, the Pörner start-up team required the technical specifications within shortest time and completed the acceptance test successfully.

This demonstrates impressively the wide system-immanent flexibility of Biturox® Reactor in producing tailored particular bitumen qualities from different feedstock components. ■

christian.filz@poerner.at

Pörner is a Leading Company

The Pörner Group ranks among Austria's Leading Companies

Vienna (Margot Simonis) That the Pörner Group is well established and specialized in construction of process plant units is primarily known by them who use our services.

But now it is also noted by the public, because the Pörner Group was awarded the Certificate "Leading Company Austria" in Mai 2011. Therewith Pörner ranks among Austria's Leading Companies.

"The Leading Companies' power of innovation is the basis of the prosperous export economy, having made Austria a world market leader in several sectors", said Brigitte Jank, President of the Wirtschaftskammer in course of the event.

The aim of this initiative taken by the Wirtschaftskammer Vienna is to present important national business companies to the public. They take the curtain calls and are further advanced by marketing and networking platforms.

"Together with their expert knowledge, their valuation of condition and self-confidence the Austrian business elite would not only be the dignified European Champion but also joint favorite for the World Cup", opines Heinz Hoffer, Managing Director of the "Austrian Leading Companies".

Pörner Ingenieurgesellschaft meets the required characteristics of an Austrian Leading Company: special know-how and a high level of value creation, the right sense of responsibility and sustainability in corporate management are administered and exercised for almost 40 years. ■

Franz Wulz, Managing Director Leitbetriebe Austria; KommR Brigitte Jank, President of Wirtschaftskammer Vienna; Peter Schlossnikel, Managing Director of the Pörner Group; Heinz Hoffer, Manager of Leitbetriebe Austria

NETWORKING

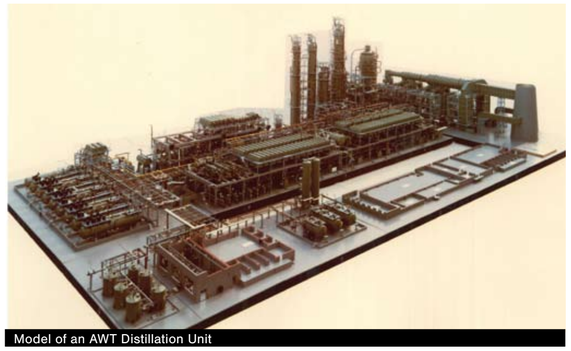
First supply contracts for Eastern Europe

Leipzig (Lutz Hoffmann). EDL increased their efforts to build up delivery transactions to Russian regions/CIS in the last years.

In doing so they are focused especially on those refineries, where business relations already exist.

Going back to their roots, EDL try to continue the tradition of former GDR-"Chemieanlagenbau", although yet on a small scale.

First results could be achieved by closing supply contracts for components and equipment for crude oil processing units with customers in Azerbaijan, Russia and Ukraine. Further agreements on the supply of equipment are in preparation. ■


Model of an AWT Distillation Unit

COOPERATION WITH INVENSYS

Optimized Process Control

Leipzig (Rolf Gambert). Optimization and developing of process controls will enhance considerably the efficiency as well as the economic feasibilty of technological processes in chemical, petrochemical process plants and refineries.

By concentrating their experineces EDL and Invensys gain excellent synergy effects.

How does an APC process proceed?

At first a basic analysis is made in a study, whether the application of this method would be a noticeable economical benefit for the customer. If this is profitable, the facility's adjustment settings are to be adapted: for this it is necessary to record the actual state of the controller interventions during normal plant operation over a certain period ("timeline").

The facility's characteristics are examined by engineering inspection, which means, to analyze the control variable towards settings modification. Dynamic design models and simulations are run with the results to demonstrate the potential improvement.

The result of this "Advanced Process Control" process is an entire facility model, which can be used "offline" as well as "online". However, the application of an APC system and its modifications can only be realized in close cooperation with the facility's operators. ■

rolf.gambert@edl.poerner.de

HIGHER ADDED VALUE

Catalytic High-Pressure Hydrogenation

Leipzig (Thomas Krumsdorf). Higher added value can be achieved by increased utilization of energy resources. This implies positive effects for the natural environment as well as industry.

Catalytic High-Pressure Hydrogenation is one of these processes. It is possible to convert heavy residues as well as coal into useable hydrocarbons by therma catalytic scission within simultaneous addition of hydrogen. For this feedstock is hydrogenized in reactors with temperatures from 460°C to 480°C and pressures from 200 to 300 bars. This process features a better conversion rate than other conventional treatment processes. Feasible conversions of coal range from 90 to 98% and of short residues 95%. Remaining residues can be used for the production of energy and respectively hydrogen.

This process is a valuable alternative to visbreakers or hydrocrackers.

EDL has developed this process in an experimental model together with partners and is going to demonstrate this innovative process and its benefits to interested customers in the refining and power industry. ■

References of EDL

Project:
Revamp of crude oil distillation unit RD4

Customer: OMV Refining & Marketing GmbH
Location: Schwechat, Austria
Completion: October 2010

The crude oil distillation unit' revamp took place within the four weeks refinery's shutdown and was accomplished by EDL on schedule as well as within budget.


RD4- Crude-Oil-Destillation-Unit

Project:
Propylen C3 splitter

Customer: PCK Raffinerie GmbH
Location: Schwedt, Germany
Completion: May 2010

Construction of a new C3 splitter for the production of propylene in "polymer grade" quality. It was a process engineering challenge for EDL and a logistical masterstroke of the project team to erect a column with a height of 84m and a weight of 375t.


C3-Splitter, highest local building

Project:
Lube oil re-refining plant

Customer: Puralube
Location: Elsteraue, Germany
Construction period: 2007-2008

Puralube Germany GmbH recycles and converts used oil by using the innovative HyLubeTM-process to API group II+ high-class base oils.


Placing of the colonne

Project: Facility for the production of epoxy resins

Customer: LEUNA-Harze GmbH
Location: Leuna, Germany
Completion: 2007

Epoxy resin components are produced in the new and modernized facilities and merchandised worldwide as trade mark Epilox®.
In this project more than 180 m Euro had been invested at Leuna site since 1995.


LEUNA - Resin-Unit 3

Main targets achieved - new challenges expected

Vienna (Wolfgang Heger). As engineering company in the process technology we achieved our goals set in the last decades. In Austria we are number One and in Germany one of the best autonomous engineering companies. Plants at highest level of difficulty (like Melamine at 200bar, 300°C process conditions or FCC revamps) were completely designed and operated.

Increased revenue
The development of annual turnover up to 50 m € is due to the parent company's organic growth, the EDL Anlagenbau/ Leipzig acquisition and the setup of further enterprises in Ukraine and Romania. Nowadays we are able to realize larger projects as well as to increase our scope of services and supply up to turn-key implementations. Currently our revenue is increasing continuously by enhancement of the process engineering activities and focusing on EP and EPC contracting in new and receptive markets.

Again and again - Bitumen
Road construction is booming worldwide. Hence the demand for Pörner Bitumen plants is sustainably high. The Biturox® process – originating from OMV - has been developed to a technical standard which enables to produce high quality bitumen out of low-level crude oils by specific chemical modifications.

Revamps
A lot of industrial plants, built 10 to 20 years ago, need a refit. Our group is specialized in modification and optimization of existing plants. The in-house process engineering task force has been extended up to 50 specialists. Thus the potentials of improvement like increasing capacity; product quality as well as energy efficiency (e.g. by installing modern columns) can be identified and realized.

Quality and value for money
On the local markets in central and Eastern Europe we compete successfully with the international contestants: due to strong local presence and thorough detailed work on each single project Pörner increases the additional value for the investors. The Pörner engineers' ambition to bring out the best for our customers needs, enhance continuously our reputation in the engineering industry.

Currently we are proceeding with preprojecting several new chemical process and bitumen plants in Asia, Russia, the Gulf Region and South America. In the following months, these efforts should lead to the signing of supply contracts.

Thus we intend to position the Pörner Group even better on the global market. ■

Wolfgang Heger
Sales Manager Pörner Wien
wolfgang.heger@poerner.at


Signing of the Samir contract:
J.M. Ba-Amer and Wolfgang Heger

The SAMIR Biturox® Project

Bitumen for an emergent region

In July 2011 Pörner Ingenieurgesellschaft hands over on schedule the Bitumen plant complex erected turn-key in Morocco

Marrakesh (Christian Opitz) Within the scope of its refinery extension program, the Moroccan oil company SAMIR awarded Pörner Ingenieurgesellschaft in October 2009 with a contract for the turn-key construction of a Biturox® Bitumen Plant including tank storage and filling facilities in their refinery in Mohammedia.


Bitumen piping

By this investment, SAMIR is in a position to increase its already existing bitumen production to complete Morocco's common bitumen demand.

The SAMIR bitumen plant processes vacuum residues of Arabian Light crude oil. Pilot product tests were accomplished at the Biturox® Pilot Plant of the OMV bitumen laboratory in Schwechat, Austria to verify the guarantee parameters. Thus the increased quality requirements on bitumen binders for a higher lifetime of road paving are fulfilled.

Premium Products
Because of the climatic conditions PEN 40/50 is the main product used in Morocco. Further grades are PEN 60/70 and PEN 80/100. The plant is designed to produce also industrial grades, such as 85/25 and 115/15. For the process design Pörner granted to SAMIR the thirty eighth license for the Biturox® process worldwide.

Production capacity tripled
The over all plant consists of the Biturox® Plant, product storage tanks of big volume and the filling unit for tank trucks. The bitumen storage is charged over a distance of approximately 2 km via connecting pipelines laid on piperacks.

By means of the new plant with a nominal capacity of 280,000 Tons per annum, the original production of 140,000 TPA is tripled to a total of 420,000 TPA road paving bitumen. As a consequence, SAMIR is becoming one of the leading bitumen producers in North Africa.

The Process
For the production of the bitumen, the feedstock components originating from pure crude (i.e. vacuum residue and a lighter flux) are blended in-line, preheated to process temperature and charged to the Biturox® Reactor continuously. The chemical reaction is initiated by atmospheric oxygen. By this the polarity of the aromatic components of the feed is increased under pressure and by exact temperature control - so to reach exactly the desired parameters (i.e. PEN Index and RTFOT Aging Test) that represent a high quality bitumen binder.
As the reaction is exothermic, the optimum reaction temperature is maintained by water injection. The finished product is cooled down to storage temperature and pumped to the tank storage, respectively to the tank truck filling stations.

The oxygen-poor off-gas from blowing, passing off from the reactor head, is mainly relieved from contained hydrocarbons by condensation and subsequently treated thermally at high temperature in an incinerator.


New built Bitumen tanks

The Client
Under J.M. Ba-Amer, Managing Director of SAMIR and his active team, in total 1.5 billion Dollars have been invested in the upgrading of the refinery in Mohammedia (30 km north of Casablanca) by the installation of 12 new process plants over the last six years. As a result, more feedstock for bitumen production is available.


Tank construction

The Project
For Pörner as licensor and contractor, the SAMIR project in Morocco was the first turn-key (EPCC) realization of a complete bitumen complex with all infrastructures outside of Europe.

While the process design and the selection of machinery and equipment was – after more than thirty Biturox® units supplied – a common routine for the Pörner team, the execution of all local services and supplies (civil construction, erection) demanded a careful local management on site in Mohammedia. In this context, the Spanish Contractor EMMSA was found to be an experienced partner to execute the local erection works.

Although the procurement of equipment - due to a delay in financing - started later, the project could be managed to be finalized at the agreed price and put into operation at the date requested by SAMIR - July 2011.

The Pörner Team and its Partners
For the elaboration of the design of the Biturox® Plant the bitumen team around Christian Opitz, Project Manager and Jana Foltyn, Process Manager involved all engineering departments such as machinery and apparatus, piping, electrical and instrumentation/automation as well as civil construction and erection.

The long-lasting co-operation of Pörner with its alliance suppliers for the delivery of the components required especially for bitumen processing proved to be efficient again in this project. In that way a bitumen plant was constructed that produced on specification from the first day on and that will do so for many decades.

The project was financed by Raiffeisen Bank International (RBI) on the basis of Austrian export coverage provided via Österreichische Kontrollbank (OeKB).

New Markets
Morocco is one of the highly-developed countries of Africa. There is on-going investment in the extension of the road network and infrastructures.

With its modern bitumen production, SAMIR contributes to this development. The main product in Morocco is road paving grade 40/50. The annual demand of Morocco is estimated to be approximately 400,000 tons.

As Youssef Ouhilal, Sales and Marketing Manager of SAMIR stated in May 2011 at the ARGUS Bitumen Conference in Marrakesh, SAMIR also intends to export bitumen: mainly to North Africa and also to West and Central Africa, regions with shortage in supply of bitumen. ■

christian.opitz@poerner.at


The Pörner start-up team
Herbert Böck, Matthias Urban, Werner Gindl, Gebhard Kracher, Wolfgang Weissmann

SAMIR - a leading oil company in North Africa

SAMIR (Société Anonyme Marocaine de l'Industrie du Raffinage) was founded in 1959 and is a public enterprise listed on the stock exchange.

The main shareholder is Corral Marocco Holding with 67.3%. Currently 1,100 persons are employed.

Over the last six years in total 1.5 bn Dollars were invested in extension and upgrade of the refinery in Mohammedia (30km north of Casablanca), in doing so twelve new plants had been constructed.

In the field of bitumen SAMIR intends
- to produce solely high-value quality products
- to satisfy the entire national demand of bitumen by local production
- to develop a severe win-win partnership with local bitumen customers
- to create efficient logistics for storage and distribution

It is SAMIR'S target to become the main bitumen manufacturer of the region - to meet the entire national needs of bitumen and in addition to export it to the North as well as West African markets.

The total demand of North African countries (Algeria, Tunisia, Libya and Egypt) is estimated to be 2.4 m TPA.

At present 1.5 m TPA are produced in the region and 0.9 m TPA are imported. From 2012 the new Biturox® plant enables SAMIR to supply approximately one quarter of the total demand. ■


Process control system

The Transafrican Highway

Already in the sixties of the last century the planning of a visionary project started. The targets were to promote trade in Africa as well as to reduce poverty.

The total length of the nine planned highway routes amounts up to 56,683km. It would connect Cairo with Dakar, Tripoli with Windhoek, and Lagos with Mombasa.

Highway No. 1 already interconnects all North African countries, but three East-to-West traffic ways (Highway 6, 8 and 9) as well as a complete North-to-South connection (Highway 3) are only fragmentary implemented.

"African transport costs are among the highest worldwide, because of the inadequate infrastructure", quoted K.Y. Amoako, 1995-2005 General Secretary of ECA (Economic Commission for Africa), *"That is why African goods are less world-marketable. A study commissioned by the World Bank showed that a 10% reduction of transport costs would count for a 25% increase of African trade."*

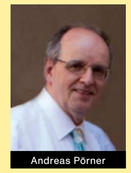
By 1997, the African continent (excluding South Africa) had been provided with 171,000 km paved roads, 18% less than Poland had, that has about the area of Zimbabwe. At present 85% of non-paved roads are impassable during the rainy season. 70% of Ethiopian population has no access to weather-proof roads.

Anyhow, meanwhile more than the half of the entire highway network had been paved.

But road maintenance still represents an enormous challenge under the existing technical, climatic and political frame conditions. ■


Bitumen filling unit in Mohammedia

35 Years of experience in „Black Gold"


Andreas Pörner

Vienna (Andreas Pörner) Producing bitumen today is more attractive than ever. During financial crises the prices for crude oil and the consumption of heavy, sulfur-containing marine diesel fuel (bunker oils) have dropped, while at the same time the need for bitumen has increased worldwide. As a result Biturox® plants for high-quality road bitumen are much more economical.

World leader in bitumen oxidation
The Biturox® process is the leading technology for bitumen oxidation. Since its foundation in 1972 Pörner has granted 41 licenses worldwide. More than 8% of the bitumen world production amounting to 100 m TPA is produced by Biturox® process plants (the remaining part is mainly produced by direct distillation of heavy oils).

Biturox® plants are mostly erected at refineries or (less often) as stand-alone units. The plants have throughputs of 100,000 to 500,000 TPA (with one reactor) and up to 1,000,000 TPA (with 2 reactors).

More flexibility for refineries
The Biturox® process allows producing bitumen out of middle grade crude oils, as preferred of fuel refineries. Thus they were successfully implemented into highly-engineered refineries in Europe and Asia.

The continuous process is based on the internal loop reactor with a multistage agitator and pressure maintaining. The efficient and yet gentle feed-in of atmospheric oxygen as well as exact temperature control allow a precise control of the chemical reaction released by precisely operating air oxygen blowing.

Intelligent products
The selection of raw material mixtures are determining for producing bitumen cost-efficiently. Pörner identifies in practical pilot tests the achievable qualities for a plant based on the customer's given applications.

The bitumen industry trend titles to special bitumen with stiffer grades, whereby roads can be built with a reduced layer by higher life cycle at lower costs. This so-called Multigrades Bitumen can be produced very economically by the Biturox® process and Pörner know-how. ■


Biturox® -Unit OMV, Schwechat (Austria)

CO_2 production out of renewable sources

Vienna (Thomas Olbrich) Early in 2011, PÖRNER+PARTNER were assigned by the French Gas Group AIR LIQUIDE with the design of a CO_2 Recuperation Plant at the industrial complex of Donauchemie in Pischelsdorf (Austria).

The raw gas will be charged from the adjacent Bioethanol Plant, that had also been designed by Pörner.

Carbonic acid gas is used for several industrial applications, such as welding, food preservation or carbonised drinks.

The world leader Air Liquide is primarily specialized in technical gases.

In this project PÖRNER+PARTNER execute the structural layout and authority engineering, the elaboration of tender documents, the static detail planning and site supervision.

The project includes a 350m long pipe routing (mainly on newly built pipe racks) from the Bioethanol Plant to the Air Liquide site, the machinery hall within the liquefaction, the storage including five storage tanks at 330m³ as well as four truck loading stations.

According to an analysis of the Joanneum Research Institute the bioethanol produced in Pischelsdorf will cut down Austrian traffic's heat-trapping gas by 380,000 tons, especially CO_2.

The Air Liquide recuperation unit for CO_2 means an additional, sustainable improvement of the natural biogeochemical cycle: *"This investment enables us to recuperate CO_2 out of regenerative sources - to substitute CO_2 from non sustainable sources. Therewith we are able to expand our market position"*, explains Jean-Luc Robert, Managing Director of Air Liquide Austria.

CO_2 released from alcoholic yeast fermentation treated by Air Liquide, is


Construction site Air Liquide, Pischelsdorf

delivered in liquid condition mainly to beverage manufacturers.

In view of the annual capacity of over 100,000 tons, Air Liquide sees an enormous potential for Austria and the neighboring markets.

Combining a safe and reliable supply with ecologically produced carbon dioxide with proven engineering services, individually optimized overall solutions can be offered to the customers.

After an improvement of the founding ground by vibro-compaction the ground breaking took place on 26th of April 2011. The plant start-up is scheduled for February 2012. ■

Thomas Olbrich
Managing Director Pörner+Partner
thomas.olbrich@poerner.at

PÖRNER GRIMMA

Competence in speciality chemical plants

Eco-silicate extraction out of rice grain peel


Gerhard Bacher

Grimma (Gerhard Bacher). The German Pörner Ingenieurgesellschaft located in Grimma has concentrated on speciality chemical plants: working successfully in the niche of constructing high-specialized units, in which novel products such as special plastics and chemicals are produced.

Together with longtime technology partners, new processes were developed and existing ones improved - to realize these in the following worldwide several times. The related plants are completely designed in-house and supplied under EPCM (engineering) or turn-key contracts.

Formaldehyde

Over the years and in close cooperation with the longtime partner Dynea, the silver catalyst process was continuously enhanced to become the recognized best of its kind. This is definitely confirmed by the international customers in technical and economical process comparisons.

Based on the experience cumulated over twenty years at the construction of formalin plants, Pörner Grimma engineered and supplied in the last years seven units, including the second largest worldwide in Gubakha, Russia. All of these were started-up successfully.

Pörner Grimma offers - together with proven licensers - a large variety of downstream process units to formalin, for production of hexamine, pentaerythritole, glues, resins and novolaks.


Silicate out of rice grain peel


Hexamin unit Metafrax, Russia

Eco silicates for the future ...

The quest for innovation and the pioneering spirit is continuously vivid at Pörner Grimma: precious silicates can be produced out of peels generated at the polishing of rice.

For this the rice peels are burned in biomass ovens and the generated energy is used for steam and electricity production. From the ash of the rice peels very pure silicon dioxide can be extracted economically. This can be used for the production of "green tires", for the electrical and electronics industry and the food industry and is expected to be - in future - also applied in solar energy plants.


Formaldehyd unit Bakelite, Germany

Pörner Grimma works on the production of precipitated amorphous silicates out of rice peel ash. The research is done together with an US licensor with the aim of commercial and industrial application.

Such units are viable for all rice growing regions worldwide, like USA, South America and - most notably - Asia.

Special chemicals

Based on its structural setup and expert knowledge, Pörner Grimma is able to design and construct any specialty chemical plant based on customers' process and know-how.

In doing so, Pörner recently realized units for the production of solar grade silicon, raw benzene, catalysts, salicylic acid, PHBS, latex, tensides, PP and PE. ■

gerhard.bacher@poerner.at

PÖRNER LINZ

Serving the domestic industry

Capacity increase of a plant for the production of bituminous sealing webs


Eugen Gotter

Linz (Eugen Gotter). BÜSSCHER & HOFFMANN are producers of high-quality roofing and waterproofing membranes made from polymer and oxidation bitumen for 150 years to protect buildings against influences of bad weather and environment. To increase the capacity and flexibility of the manufacturing plants, a new production line was erected at the Enns location.

The membrane machinery line was installed and extended by the AG itself. In Mai 2009, Pörner Linz was entrusted with the general engineering, the new buildings' integration and the utilities supply (raw materials, heat transfer oil, cooling water, off-gas), connected with the boiler house, the mixing units, the water well and sewer system. This was a follow-up order to the project to modernize the utility plants executed in the years 2004/05, by which a cooperative work relation with the costumer was established that is still going on.

The significant challenges of this project included primarily integrating the new production line at running operation and - secondly - to extend the utility systems under consideration of existing supply reserves and ecological framework requirements.

The Pörner Linz team mastered this project within 22 months, by handling authority engineering and hearings, basic and detailed engineering, media supplies and utility systems, coordination of the executing contractors and supervision of erection. That way, the commissioning and start-up were successfully completed in April 2011. ■

eugen.gotter@poerner.at

BÜSSCHER & HOFFMANN, a traditional and dynamic Austrian company, is a subsidiary of the Kwizda Holding GmbH in Vienna, with a wide range of chemical products.
In addition to the factory in Enns, the company operates several subsidiaries and warehouses in Germany, Czech Republic, Croatia, Hungary, Poland and Romania.

Büsscher Hoffmann


Productivity and ecology technology at the plant in Enns, Austria

INFORMATIVE VISIT TO EDL

Saxon Minister for Economic Affairs visits EDL

Leipzig (Roland Ludwig). In February 2011 the state minister for economic affairs, work and traffic, Mr. Sven Morlok, visited EDL Anlagenbau GmbH (ED) in Leipzig. The aim of the visit was to become acquainted with the enterprise and to discuss current topics and typical concerns of a mid-size engineering company.

The managing directors of EDL, Roland Ludwig and Wolfgang Kursch used the opportunity to familiarize the minister with the work spectrum of a process engineering and plant construction company. In particular, the strong presence in the German refineries was highlighted and the recent activities on the Russian market were introduced.


Wolfgang Kursch (EDL), Saxon Minister Sven Morlok and Roland Ludwig (EDL)

In a presentation and during a walkabout through the company the versatility of EDL as process technology orientated plant constructor was demonstrated. ■

The Engineering Sailing Cup 2011

Pörner Crew sailed to 3rd place

Once, Eugen Gotter's crew (Pörner Linz) won the „Pretzel Regatta" in 1993 arranged by the bakery guild of Steyr. Afterwards Arno Hemm a friend and crew member developed the idea of an annual regatta for enthusiastic sailing engineers. In April, 1994 the event started with four crews around the isle of Mallorca. In the following, the regatta got such brisk reception within the European engineering scene (with seventy (!) teams participating) that the following event organization arrangements were no longer manageable by the previous winner crew. The sight of companionship between the engineers got more and more lost because of the huge number of participants.

Thus, after 15 years in 2009, the original team of founders went on a new path by introducing an „Engineering Sailing Cup" (ESC). For nostalgic reasons the first regatta was sailed again around Mallorca. The event was reshaped to a family-type size with maximum 10 crews and as identical boats as possible. While the race in 2010 led from Split to Dubrovnik (Croatia), the piloting area of Istria was chosen for the tournament of 2011.

From the logbook of ESC 2011 around the Kvarner Isles...

The run started on the 30th of April in Pula. Further main destinations were Krk, Mali Losinj,Ilovik, Rab and Unije. The Pörner crew (Peter Schlossnikel, Wolfgang Kursch, Klaus Prexl) was commanded by the proven old sea dog Eugen Gotter („Skippy"). The successful Pörner motto „efficient, faster and better" resulted in a win of the day.

The great sportive efforts of the team were the third place at the end of the regatta, supported by a special doping. Some bottles of best Austrian Wine – which were after an in-depth examination by the Organization Committee approved to be within the strict rules and finally cleared to the last drop with the support of all the present friends of sailing.

Limmerick:

At the PÖRNER boat everybody knows:
The white wine and the red wine flows.
They are drinking it every day in their throats.
And wear the yellow/black bee coats.
The Austrians always have the party boat...

„Fair Winds and following Seas!"- looking forward to the next event in 2012. ■

ROMANIA

Pörner underwrites children soccer

Bucharest (Michael Volkmann). The Pörner Group does not object to play soccer regularly. We have contested several soccer competitions during the last years and achieved a bunch of cups.
In this domain we start to break new grounds.

Pörner Romania underwrites "F.C. VIVERA". This association offers children meaningful leisure activities in Bucharest.

Boys from 7-12 years exercise soccer in three different classes with the aim to become a soccer star once.

They are actively supported by association managers Mr. Munteanu Florin und Mr. Stefan Sorin, who are devoted to the project.

„F.C. VIVERA" plays in the COPII MINI FOTBAL, the Romanian Junior Soccer League. Until now the boys demonstrate their skills in friendly matches. ■

Pörner Romania on expansion path

Pörner Romania is the youngest, but very successful subsidiary.

In headquarter Ploiesti more than 40 engineers and specialists currently perform engineering services out of one hand. Since its foundation in 2006 over 100 contracts were implemented, regular customers such as Petrom were acquired and several framework agreements with industrial customers were concluded. ■

michael.volkmann@poerner.at


Pörner office in Victorian mansion in Ploiesti, Romania

EDL on castle tour

The Pörner Group leader meeting and EDL company outing

Leipzig (Ulrike Fischer). On 3rd of September morning, the Group's Leader Meeting was scheduled at Güldengossa Castle and in the evening the EDL company outing took place at Püchau Castle
In Güldengossa Castle's stately ambience there were presented current and perspective projects, as well as individually discussed subsidiaries' matters of further improvement.

In the afternoon the Castle Tour directed to Püchau Castle for the traditional EDL company outing. The castle once founded as Bergspornburg in Muldental underwent several demolitions and renovations during it's over 1,000 years of history. It had been awakened of its Sleeping Beauty Dream a couple of years ago and is nowadays in use for movie setting as well as attractive venue.

After a sparkling wine reception and an extraordinary speech of our shareholder done from the castle's balcony, EDL's employees and guests adjourned to the beautifully decorated halls expecting the marvelous buffet's opening. A severe battle was not to be expected because there was opulent food for all. ■


Engineers from five different countries set the course for the Pörner Group future.


Güldengossa Castle


Püchau Castle


the beautifully decorated halls

Turn-key - an intelligent alternative

Well prepared, the construction of process plants can be executed rapidly at a fixed price.

Vienna (Andreas Pörner). If an investor decides to build a new plant he intends to produce market-tailored products by means of highly productive automated but also flexible manufacturing processes within shortest possible time and at lowest investment costs.

There are three principle methods how to place orders for a plant to construct:

Shorter construction period ...

- EPCM Contract (Engineering Contract) – An engineering company is entrusted to execute the entire engineering and procurement services. The supply of equipment, construction and erection are contracted on the client's behalf.
- EP Contract (Supply Contract) – Engineering, procurement and equipment supply is done by the contractor, whereas contracts for site works are assigned separately (by the client).
- EPC Contract (Turn-key realization) – The complete project is awarded to a single general contractor.

Nowadays, producers maintain only a minimum of engineering resources. They tend to delegate responsibilities for a new plant construction as far as possible. Thus turn-key contracts are more and more preferred.

Turn-Key Realization

The entire project is awarded to a general contractor by a single turn-key contract. The whole scope of work including engineering, procurement, supplies of equipment, civil construction and erection up to the start-up is given in one hand. For the investor a single contract partner guarantees and is liable for the entire project's completion.

There are several significant advantages for the client:

- A single contract is to be tendered, negotiated and concluded.
- The price is lump sum and the risk of cost overrun is largely eliminated.
- The own resources are on low level and limited to supervisory project management and controlling of contract fulfillment (acceptance, quality assurance, monitoring of all critical activities and dates).
- All plant construction is contracted to the general contractor who is responsible for the proper carrying out of all works by suppliers and sub-contractors.

Guaranties as basis for financing

The contractor's guaranties and liabilities rely on the agreed process and functional guarantees, regarding the engineering design, equipment supply, civil construction and plant erection as well as important intermediate key-dates and completion schedules.

Liabilities corresponding to the contract value are usually higher than in other types of contract.

Financial institutes prefer to finance a project that is supplied completely by one reputable contractor, since the risk of project's failure is evaluated to be lower.

Shorter Construction Period

The main argument for a turn-key construction of a process plant is certainly the expected shorter construction period. The general constructor can set up his full potential – with minimum of bureaucracy - to the engineering, procurement and construction tasks.

Construction period can be significantly reduced, if the contractor provides the required license for processing technology, like Pörner does for Biturox® Bitumen Plants.

Basic and detailed engineering are adapted quickly to the current project. Most of technical solutions for the detailed design are already "in store" and the amount of bulk-material data available from similar plants. The optimum construction and erection sequences are well-known and can be integrated in sub-contracts with local contractors.

Comprehensive references are the best basis for a turn-key contract, when it has to be completed quickly, on high technical level and cost-efficiently.

The contractor's point of view

A turn-key contract has pros and cons for a general contractor:

- A Turn-Key contract represents a large volume of trade.
- The profit potential is accompanied by a higher risk than other types of contract.
- In foreign countries the contractor has to rely on local sub-contractors often unknown but their work performance has to be guaranteed by him.
- When performing local commodity works (construction, erection, local supplies) only small overheads can be calculated while high risks must be taken. As soon as a sub-contractor is assigned with works he can – in case of any alterations – easily enforce additional claims.
- Local fiscal duties in a project in a foreign country represent further risks for the general contractor.

Realizing turn-key projects is financially rewarding for a general contractor, if he knows his services and supplies quite exactly and is able to keep scope and prices – down to the details – under control.

The crucial point: a "waterproof" contract

The placing of a turn-key contract must be carefully prepared. Features which are not adequately specified as quality requirements or items not defined as scope of service and supply will not be included in the lump sum price. A general contractor seeks to win the contract and to optimize his profit consequently. Therefore he must pre-project the scope extremely detailed for the offer - mostly without any reimbursement – to be able to execute the works cost-effectively after contract awarded.

The lump-sum price agreed for the entire plant at contract signing (when no detailed design is available yet) does contain little margin for alterations requested by the client at a later date. Claims for additional costs will have a serious influence on the working atmosphere between the contract partners. The higher the contractor's core competencies, the more sucessful the turn-key contract will be.

... at a fixed agreed price.

Should the general contractor be obliged to incorporate extraordinary as well as entire parts of purchase, the investment will increase by higher risks surcharge.

Conclusion

Turn-key is very useful and recommendable, if

- the project shall be executed within shortest time,
- the project can be exactly specified already at the time of assignment,
- the contractor is also licensor of the process or has already references for similar plants.

Pörner has licensed and supplied more than 30 Biturox® Bitumen plants worldwide. By implementing the SAMIR project (see page 4-5) Bitumen production could commence approximately four months earlier due to turn-key realization. ■

Pörner Ingenieurgesellschaft mbH

A-1050 **Vienna** | Hamburgerstraße 9
Tel.: +43 (0) 50 5899-0 | Fax: -99 | Email: vienna@poerner.at

A-4020 **Linz** | Unionstraße 39
Tel.: +43 (0) 50 5899-610 | Fax: -698 | Email: office-linz@poerner.at

A-6250 **Kundl** | Mühlbachweg 11
Tel.: +43 (0) 50 5899-711 | Fax: -798 | Email: office@kundl.poerner.at

EDL Anlagenbau Gesellschaft mbH
D-04158 **Leipzig** | Lindenthaler Hauptstraße 145
Tel.: +49 (341) 4664-0 | Fax: -409 | Email: gf@edl.poerner.de

Pörner Ingenieurgesellschaft mbH, Deutschland
D-04668 **Grimma** | Leipziger Straße 52
Tel.: +49 (3437) 9854-0 | Fax: -98 | Email: office-grimma@poerner.de

S.C. Poerner Romania S.R.L.
RO-100540 **Ploiesti** | Str. B.P. Hasdeu, Nr. 28
Tel.: +40 (244) 529-151 | Fax: -299 | Email: office@poerner.ro

Pörner+Partner Ziviltechniker - GmbH
A-1050 **Wien** | Hamburgerstraße 9
Tel.: +43 (0) 50 5899-319 | Fax: -96 | Email: poepa@poerner.at

Gazintek
UA-04080 **Kiew** | V. Khvoiky 18/14, Korp. 9
Tel.: +380 (44) 495 23-24 | Fax: -25 | EMail: ukraine@gazintek.com