PÖRNER GRUPPE

PROCESS PLANTS BY PÖRNER

Innovation meets experience

BITUROX®
BITUMEN OXIDATION TECHNOLOGY

ONE OF OVER 60 BITUROX® BITUMEN PLANTS LICENCED BY PÖRNER

Customer: SOCAR – Heydar Aliyev Oil Refinery

Location: Baku Refinery / Azerbaijan

Project:

- Planning and installation of a new Biturox® bitumen processing plant for production of road paving bitumen
- Overall planning of the plant including tank farm and truck loading station
- Modern off-gas treatment system, designed for an annual capacity of 400,00 TPA

Process plants are becoming increasingly smart, but also more complex. Realizing the latest innovative solutions based on the well-proven is what counts.

Michael Volkmann, Managing Director of Pörner Ingenieurgesellschaft

INNOVATION MEETS EXPERIENCE

Mastering the challenges of transition together

Today, the process industry is facing many new challenges and opportunities: It is necessary to implement the energy and resource transition promptly under completely changed political and economic conditions. New processes for the generation of energy and sustainably usable valuable materials need upscaling from pilot to large industrial plants. Existing plants have to be adapted in terms of energy and sustainable production.

As flexible engineering partners, the companies of the Pörner Group are in an excellent position to realize the upcoming transformations together with the operating companies.

Always being a pioneer in innovations & technologies – we actively support our customers in decarbonization, both in the development of valuable, recyclable products from resource-saving production and in the application of alternative energy sources.

With more than fifty years of experience in international plant engineering and a strong focus on innovative process engineering and automation, we are qualified to implement new concepts effectively and flexibly.

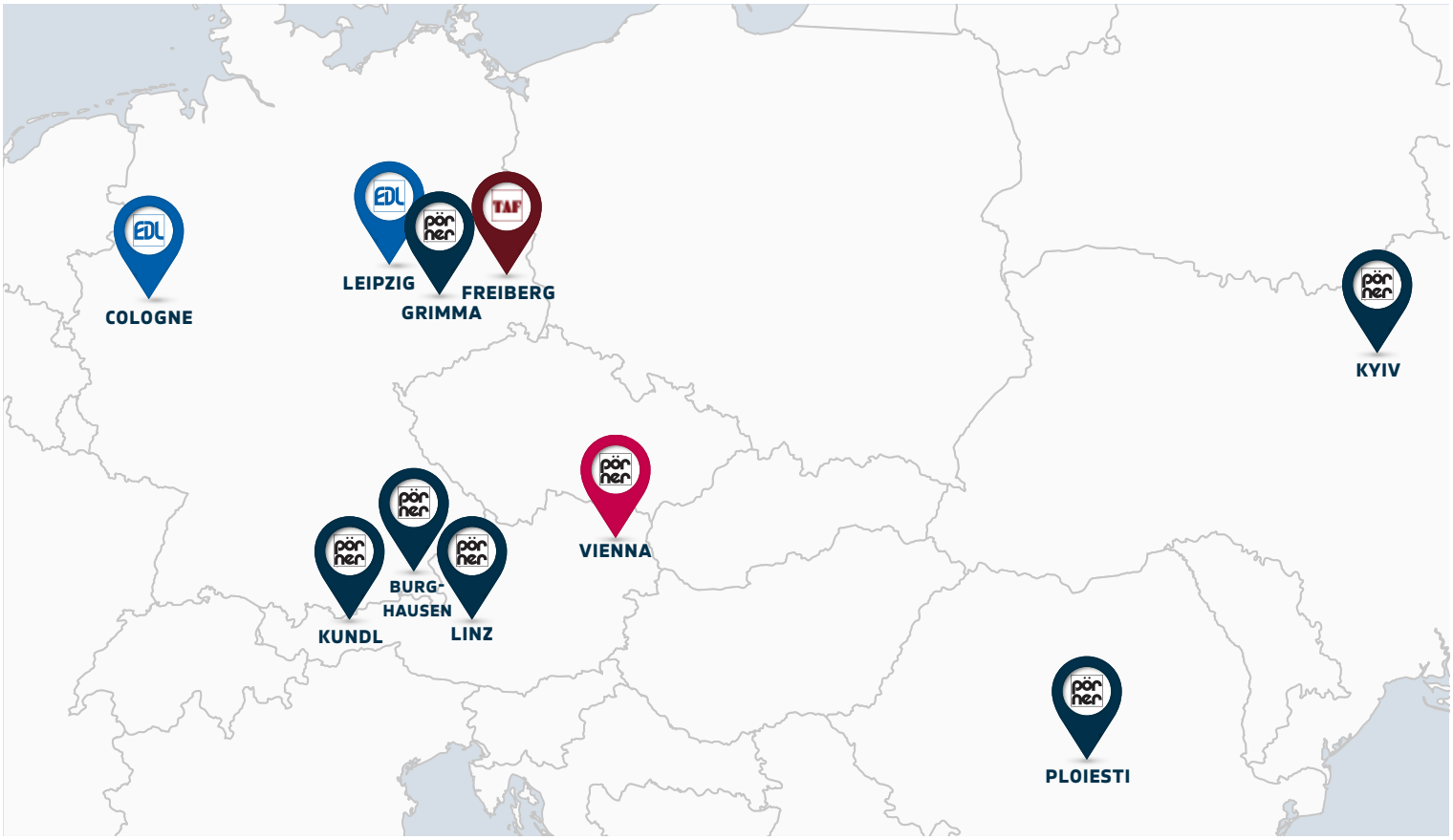
As a medium-sized group of companies with a workforce of more than 580 employees, Pörner has the expertise and the capacity to manage complex holistic projects responsibly. Our engineers plan and realize these projects from the first draft through to planning, procurement and construction up to successful commissioning – from one single source.

Our references from thousands of completed projects impressively prove it: through creativity, skill and passion for process plant engineering, Pörner engineers have won the trust of the most important industrial customers – for projects on a high technical level and with large investment volumes.

Creating customized future-proof, environmentally compatible and highly productive process plants with well-organized project management and in-depth engineering at low cost for our clients: This is and will always be our mission in challenging times like these!

Since the turn of the millenium we have been working for our customers on projects for alternative energies, PtX, BtX and products from renewable resources (bio-silicates).

Andreas Pörner, Managing Partner of the Pörner Group



A NETWORK OF ENGINEERING COMPETENCE

With companies and branches in Austria (Vienna, Linz, Kundl), Germany (Grimma, Burghausen), Romania (Bucharest / Ploiesti) and Ukraine (Kyiv) as well as the German subsidiaries EDL Anlagenbau Gesellschaft (Leipzig, Cologne) and Thermische Apparate Freiberg the efficient Pörner engineering network is unique in Central and Eastern Europe.

Over many years the Group has been well-connected with leading licensors and partners, suppliers, construction and assembly contractors. It is thus possible to execute complex projects flexibly and cost-efficiently on schedule using state-of-the-art technologies.

The companies of the Pörner Group are active worldwide:

- have already realized more than 2000 projects in over 70 countries.
- build process plants under a wide variety of geographical (cold climates, tropics, desert) and logistical conditions.
- design plants according to international standards (DIN, ANSI, ASTM, GOST etc.).

The Pörner Group offers:

- Custom-tailored service models
- Personnel continuity for long-term cooperation
- Cost savings by optimized operating processes
- Independence of third-party interests
- Global presence

THE PÖRNER GROUP

Engineering and Contracting for the Process Industry

Pörner provides the entire range of conventional engineering services to design new industrial plants and extend or modernize existing ones. International customers often request plant supply and construction on a turnkey basis.

Innovative technology and service provider

Applying state-of-the-art technologies in all parts of the world is one of our core competences.

Based on the numerous Pörner Group references, the customer can rely on a proven partner who can draw on the knowledge of thousands of executed projects, special expertise and well-proven solutions.

Specialists with many years of experience in plant engineering are the company's hallmark. The combination of senior engineers with many years of experience and dynamic young talents defines the Pörner project teams' performance.

The Pörner Group designs, supplies and constructs industrial process plants for:

- Power and environmental industry
- Refineries
- Petrochemical and
- Chemical industry
- Gas industry
- Industrial production and
- Pharmaceutical industry

POLYETHYLENE PLANT

Customer: Borealis Polyolefine GmbH

Location: Schwechat / Austria

Project: Construction of PE4 polyethylene plant and extension by a black colouring unit

Our promise is to create cutting-edge, future-proof plants while strictly adhering to budget and schedule.

Christian Birgfellner, Head of Pörner Project Management

Revamp crude oil plant, PCK Raffinerie GmbH, Schwedt / Germany

ANLAGENBAU 4.0
we create productivity

REALIZING THE ADVANCED PLANT TOGETHER

Combining experience AND innovation for the modern process plant

By selecting the most resource-efficient technologies, high-tech equipment and systems as well as high automation and digital integration in terms of Industry 4.0, we create – in close cooperation with the customer – plants with:

- highest product quality and flexibility
- optimum energy efficiency and low utility requirements
- high plant availability and safety
- low maintenance and the possibility to extend
- best possible environmental compatibility.

The Pörner specialists have the expertise to design, plan and procure plants with future-oriented, sustainably effective detail solutions. The investor receives a process plant that remains competitive for many years in terms of sustainability and meets the current requirements for climate and environment.

Anlagenbau 4.0

Anlagenbau 4.0 stands for Pörner's mission to design, plan and implement the better process plant (the „Anlage 4.0") together with the customer, for the given purpose using the most advanced resources (processes, systems, components, automation).

The range of digital tools and intelligent networking enables the Pörner engineers and specialists to fully develop their expertise in a specific project.

GREEN FIELD BIOETHANOL PLANT

Customer: AGRANA Bioethanol GmbH

Location: Pischelsdorf / Austria

Project:

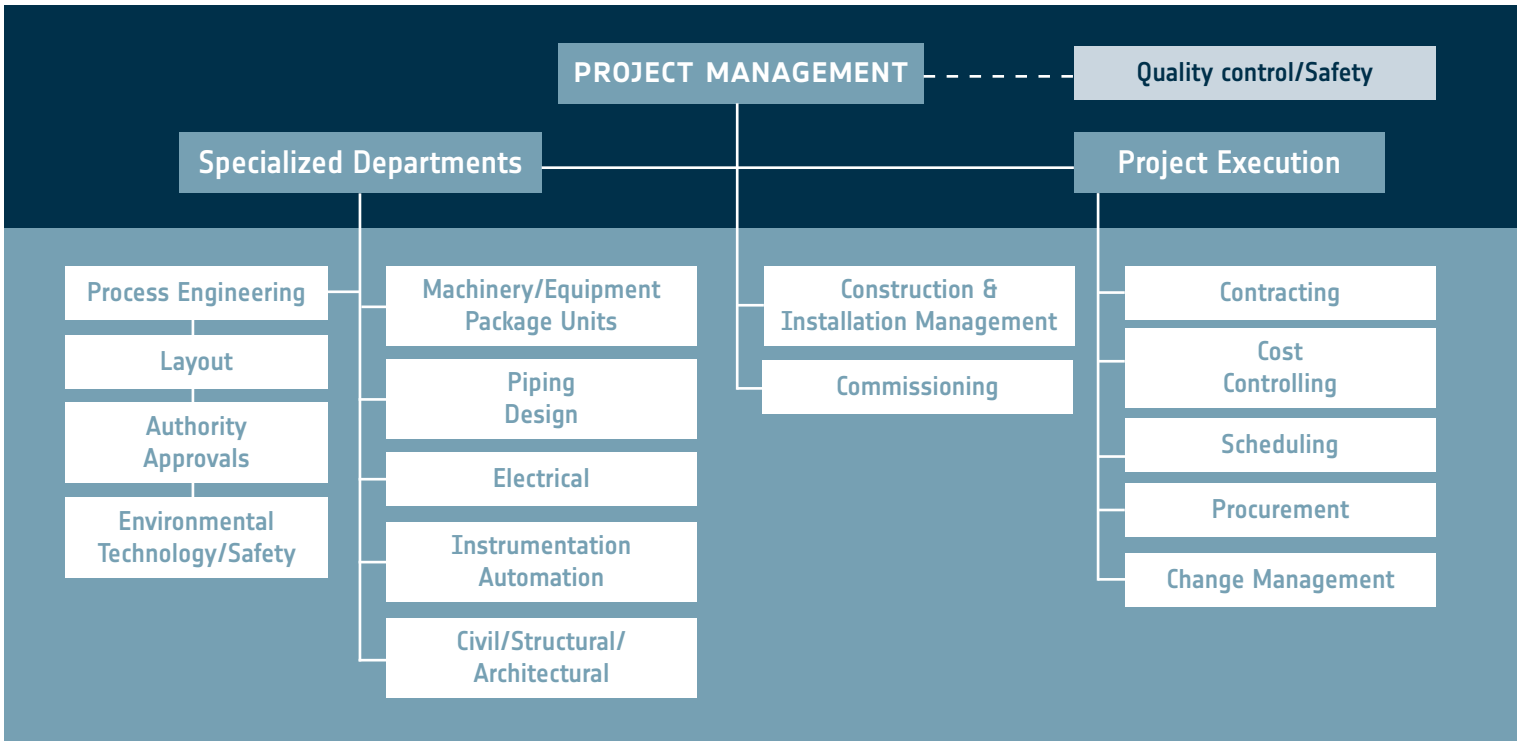
- General contracting
- Austria's first industrial-scale bioethanol plant
- Capacity 190,000 mt per year
- Investment € 125 m

Plant built within 14 months on time and on budget. Meanwhile the plant has been expanded and the capacity increased by Pörner.

Working methodology and structuring of plant engineering are in our blood. We use the matrix project organization to ensure that projects run smoothly.

Thomas Rieder, Project Manager Pörner Vienna

PÖRNER MATRIX PROJECT ORGANISATION



INTEGRATED PROJECT GOVERNANCE WITH THE PÖRNER MATRIX

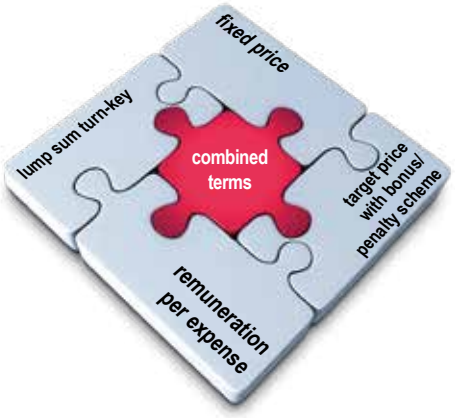
Project management and coordination – well-structured and controlled

Pörner's matrix organization combines holistic project management with the engineering departments' technical expertise to achieve the optimum project.

The Pörner project management organizes, structures and responsibly manages the plant engineering project – from the initial idea to completion and commissioning: in every phase, tailored to the specific requirements of the client.

Pörner is a project executor on the customer's side – independent of the interests of third parties. The customer has only one contact person at all stages of project execution and therefore needs only a small number of personnel for superordinate controlling, decisions and approvals.

Pörner's project managers ensure a uniform contract design with all subcontractors. They responsibly and holistically control the overall execution including workflow, cost, schedule, trouble shooting, contractual compliance and quality controls.



3 LARGE-SCALE REVAMPS IN TURNAROUND

Customer: OMV

Location: Schwechat / Austria

Project: During a refinery shutdown three revamp projects were accomplished at the same time:

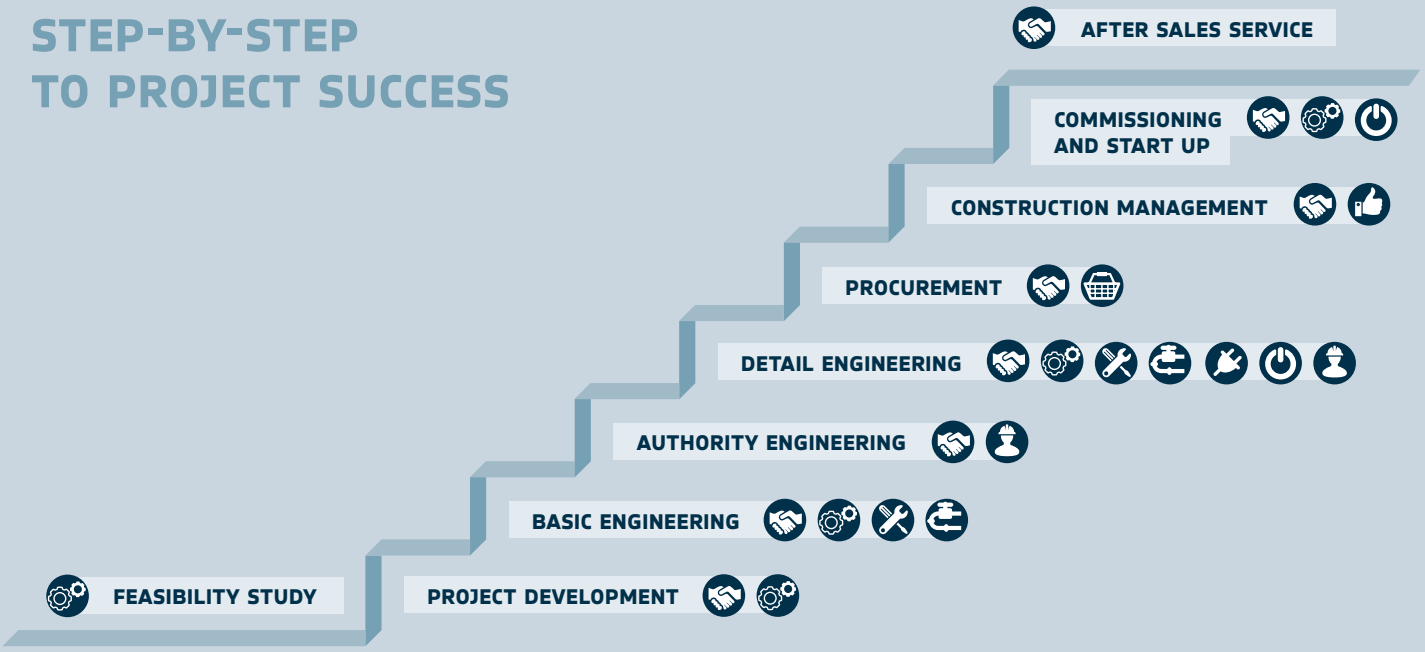
1. Revamp HDS3: reactor replacement
2. Revamp DEA2: product yield increase
3. Revamp RD4: production increase and optimum plant operation

Finalizing the three large-scale revamps almost at the same time during this plant shutdown, was an engineering, process and above all planning challenge. The planning of the reactor transport logistics alone took about two years.

We achieve the specified, ambitious goals thanks to our expertise and routine - with intensive communication and optimized workflows using integrated software tools. Best engineering practice for sustainability, safety and quality are a must.

Thomas Hermann, Head of Plant Design & Piping Pörner Vienna

STEP-BY-STEP TO PROJECT SUCCESS



ENGINEERING SERVICES OUT OF ONE HAND

The whole is more than the sum of the parts

Pörner provides all engineering services for the process plant in all plant construction disciplines – including basic and detail engineering, procurement, logistics, construction management and commissioning. A total engineering capacity of 750,000 h/year is available for this purpose. The close, direct cooperation of all Pörner engineering and construction specialists results in well thought-out, detailed solutions. This is how Pörner creates functionally integrated plants efficiently and quickly – as if made from one piece.

Overall performance without interfaces

- Pörner specialist departments carry out all engineering activities (basic and detail engineering, procurement, logistics etc.)
- Uniform project and quality standards in all parts
- Personnel pool of over 580 engineers and specialists for extraordinary challenges
- Equipment with modern software tools for all tasks
- Internationally experienced construction supervisors

Pörner's strong in-house process and automation teams and civil engineering expertise puts the process plant on a secure foundation.

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

RE-REFINING: PREMIUM BASE OILS FROM USED OIL

Customer: PURALUBE GmbH

Location: Tröglitz / Germany

Project:

- Technological quantum leap: the world's first production of base oils Group III from used oil
- Extension of the HyLube2 plant planned and designed by EDL by a new process stage on schedule and within budget
- Follow-up order for the planning and construction of the HyLube3 plant

Used oil hydrogenations are a big step towards sustainability

Sound preliminary technical planning, including cost calculation and scheduling, is essential for the smooth realisation of a project.

Luis Villalobos, Head of Project Management EDL Anlagenbau

ANLAGENBAU 4.0
we create productivity

PÖRNER CONCEPTUAL DESIGN

Well conceived from the very beginning

In the beginning, there is the idea to invest in a new process plant. For an efficient implementation, Pörner defines the project comprehensively in a preliminary project.

After defining the technology, the project team technically designs and calculates all plant components. Thus, the scope of the project and the required resources are transparent and controllable from the very beginning.

Pörner supports the investor from start to finish:

- Determination of requirements and objectives
- Selection of the most suitable technologies, considering sustainability
- Focus on process efficiency with optimal use of energy and feedstock
- Structuring into sub-units and guarantee-relevant systems
- Design engineering in close cooperation with the customer, planning of all key equipment, systems, and structures
- Budget costing for all required supplies and services
- Scheduling with critical measures, sequences, and delivery dates

Pörner provides the complete documentation (FEED, Conceptual Design) for the owner's project approval and for pre-information to authorities.

The profound preliminary project is a steady basis (scope, costs, and deadlines) for successfully implementing the project.

PHOSPHORUS RECOVERY PLANT

Customer: RWE Power AG

Location: Bergheim-Niederaußem / Germany

Project: General planning and construction of a multi-fuel conversion plant for the recovery of phosphorus and synthesis gas from sewage sludge

In Freiberg, we develop and manufacture special constructions as well as pilot and research plants with sustainability factor to enable our customers to scale up their process ideas to indust rial production plants.

Daniel Ullmann, Managing Director TAF Thermische Apparate Freiberg

ANLAGENBAU 4.0
we create productivity

CORE COMPETENCE: PROCESS ENGINEERING

Process engineering as the driving force of process plant design and construction has a high priority at Pörner.

More than 50 process engineers of the Pörner Group have been developing and optimizing processes for process plants to secure plant operators decisive competitive advantages for many years.

In collaboration with leading research institutes and partners, Pörner individually develops new process technologies from laboratory scale to verification in pilot plants up to the construction of an initial commercial plant (upscaling).

During the detail engineering of complex plants, the ongoing process engineering support ensures the optimum suitability and design of the technical components.

Focus areas of process design include:

- Energetic, environmental, and safety-related process optimizations
- Process simulations (stationary and dynamic)
- Lab and pilot plant tests
- Process engineering design for upscaling

Global cooperation of the international project team headed by Pörner Grimma

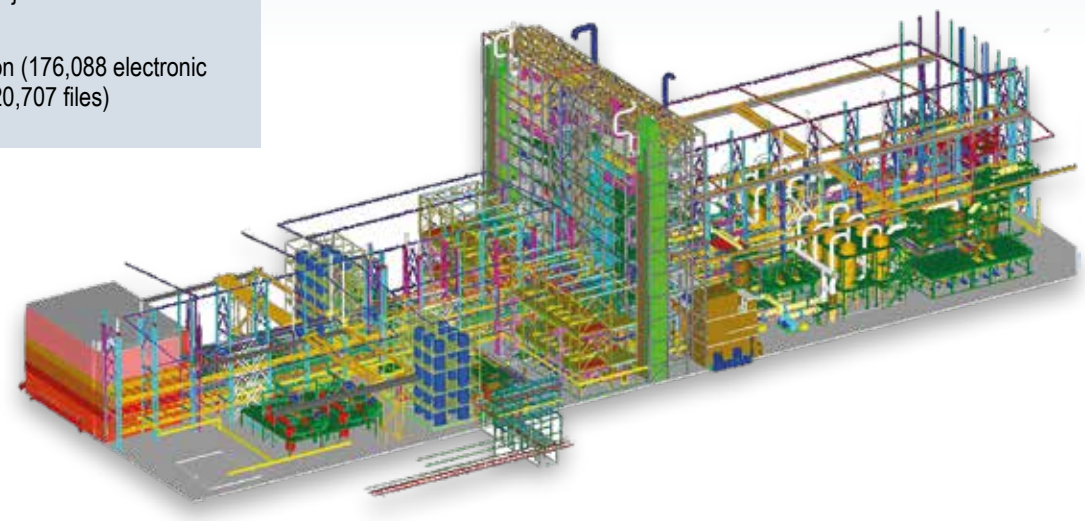
NORILSK NICKEL

Customer: PJSC MMC Norilsk Nickel

Location: Norilsk / Russia

Project: Planning of an off-gas desulphurization plant for a nickel factory

- Reduction of sulphur oxide emissions by 95 %
- Capacity 600,000 TPA sulphur
- Environmental project consisting of 25 plant sections
- International project team headed by Pörner
- Digital execution (176,088 electronic documents in 20,707 files)



Pörner is used to design plants in extraordinary conditions, e.g. for Norilsk Nickel with temperatures up to -57 °C, and permafrost soil.

Albert Traxler, Pörner Sales Manager for Asia

ANLAGENBAU 4.0
we create productivity

INTEGRATED ENGINEERING – DOWN TO THE LAST DETAIL

On-site presence ...

Pörner establishes a task force team at the customer's site for direct cooperation. The team is responsible for project execution and coordinates all engineering and execution activities.

In the course of the project the team is complemented by project engineers to meet specific requirements.

... and digitally linked

Modern communication systems link all Pörner locations with each other and with the customers or their construction sites worldwide.

In addition to simulation and specialist software, Pörner uses in-house developments such as the Pörner Integrator and intelligent database-driven CAD 3D systems.

Anlagenbau 4.0 ensures documentation of the workflow with the associated data (schematics, drawings, specifications, etc.) over the realization period. In addition, the minimization of data redundancies reduces potential sources of error.

With handing over the plant, the documentation is available to the operator in digital form – as basis for maintenance, optimizations, and expansions.

Manufacturing of the new HDS3 reactor at MAN for OMV / Austria

Transport of the long-item absorption column to Sexsmith / Canada

To ensure that our customers fully benefit from the innovation potential of our suppliers, contracts for supply and services are based on the best bidder principle rather than the lowest bidder principle. Thus, the quality advantages are multiplied.

Marvin Pichler, Head of Procurement Pörner Vienna

PROCURING FROM THE BEST

Think locally – act globally

A complex project requires well-structured procurement processes.

It is necessary to define properties, the scope of delivery, and interfaces for all equipment and systems to avoid quality deficiencies and gaps in procurement and logistics. In addition, strict procurement control minimizes the risk of delivery delays.

Pörner regularly carries out standardized procurement activities for its own and customer projects. Due to long-term business relationships with the best suppliers and executing companies worldwide, Pörner holds extensive technological and commercial market knowledge.

Thus, the customer receives the best technical components available on the world market combined with inexpensive, locally procured standard equipment (e.g. tanks, vessels, steel construction).

Pörner's expediting and inspection routines assure the customer of on-time delivery in the quality as agreed.

Best value for budgets

- Coordination of pin-pointed delivery of all plant components
- Standardization of the supplier guarantees
- Completeness of the documentation
- Quality and interplay of all components

photo: Gunvor Raffinerie Ingolstadt

FLUE GAS DESULPHURIZATION

Customer: Gunvor Raffinerie Ingolstadt GmbH

Location: Ingolstadt / Germany

Project:

- Engineering and installation of a flue gas desulphurization plant including integration into existing plant components
- Efficient reduction of sulphur dioxide emissions while simultaneously increasing flexibility in crude oil selection

Safety comes first. Life and health of our people is of top priority.
Our aim is therefore: Zero accidents!

Thomas Wendt, Head of Quality / HSE Management EDL Anlagenbau

CONSTRUCTION AND INSTALLATION – PREPARED AND COORDINATED FOR EXACT TIMING

Built safely, fast and efficiently

In order to realize construction and erection of the process plant very quickly and safely, Pörner seamlessly coordinates the contractors working in parallel.

Construction and installation are integrated parts of project execution: all measures from preparation of construction site through to completion are included from the beginning. As early as in the detail engineering phase, major construction sequences are simulated by 3D models (e.g. inch-perfect installation of a new column).

The Pörner scheduling includes optimizing of all delivery and time-critical construction sequences. The contractors work under a uniform service contract.

Experienced site managers working in teams with technical specialists respond to schedule deviations by immediate troubleshooting. In addition, they pay special attention to the highest safety and environmental standards.

The technical qualification, international experience, and social competence of the Pörner engineers ensure high-quality execution in all areas – within the shortest possible construction time.

PCK SHUTDOWN „KLEINER 16“

Customer: PCK Raffinerie

Location: Schwedt, Oder / Germany

Project: Parallel processing of 4 projects during the complex shutdown of the refinery:

1. Crude oil 1 plant: Revamp of vacuum section with new vacuum column
2. Crude oil 1 plant: Revamp of stripper section with new stripping column
3. FCC plant: Revamp of regenerator section with new regenerator
4. FCC plant: Revamp of LCO recovery

- Project execution meeting the quality standards, deadlines and budget without any accident.
- A true logistical feat was the replacement of the regenerator of the FCC plant: temporary drive-over bridges, demolition of the entire regenerator periphery, five heavy lifts in narrow conditions.
- Modular pre-dressing of the vacuum column in three segments as well as of the stair tower with precisely planned dismantling and installation sequences to meet the stipulated shutdown time.

The modernization of existing plants ensures the long-term market success of our customers - customized, economical and in a time efficient manner.

Daniel Oryan, Managing Director EDL Anlagenbau Gesellschaft

Delivery of the FCC regenerator, PCK refinery

REVAMPED
BY PÖRNER GROUP

REVAMPED BY PÖRNER – FIT FOR THE FUTURE

Sustainable productivity at optimal conditions

Retrofitting existing process plants to the latest state-of-the-art while saving resources is worth the effort. In line with the Green Shift, plants are increasingly adapted as part of the alternative process chain.

REVAMPED by Pörner means not only to renew the existing facilities, but also to accomplish comprehensive process improvements in terms of product quality, efficiency, sustainability and operational safety.
The required investment only costs a fraction of a new plant.

Pörner plans in advance the dismantling activities, the installation of new equipment and connecting elements in a precise manner to carry out construction measures in a well-coordinated manner with little impairment of the running production during a short shutdown. Smart logistics enables safe delivery of partially oversized equipment.

The companies of the Pörner Group have completed over 100 revamp projects for customers in the refinery, petrochemical, and chemical industries in the last ten years.

REVAMPED by Pörner

offers several advantages:

- Alternative plant use
- Improvement of product quality
- Increase in capacity
- Improved automation and monitoring
- Increased operational safety and availability
- Reduction of energy consumption and operating costs
- Improvement of plant safety and environmental compatibility

SDA PLUS
EDL•TECHNOLOGY

PROPANE DEASPHALTING PLANT (PDA)

Customer: H&R Ölwerke Schindler GmbH

Location: Hamburg / Germany

Project:

- Construction of a propane deasphalting plant
- Production of deasphalted oil from vacuum residue by way of liquid extraction
- Solvent used: propane

The Pörner Group runs own pilot plants and works closely with leading research institutes so that our customers can always build on customized, innovative solutions.

Jan Schwartze, Head of Technology & Process Engineering EDL Anlagenbau

Dewaxing / Deoiling laboratory in Leipzig / Germany

BITUROX®
BITUMEN OXIDATION TECHNOLOGY

SDA PLUS
EDL•TECHNOLOGY

DEWAXING
EDL•TECHNOLOGY

DEOILING
EDL•TECHNOLOGY

LEPD
EDL•TECHNOLOGY

AROMEX
EDL•TECHNOLOGY

POWER2X
EDL•TECHNOLOGY

SILICATE
PÖRNER RICE HULL TECHNOLOGY

PÖRNER TECHNOLOGY PORTFOLIO

With innovative technologies one step ahead of the competitors

Beyond the general engineering capabilities to design and implement plants based on processes by third parties, the companies of the Pörner Group have their own time-tested processes and technologies that are applied worldwide.

For these technologies, own laboratories and pilot plants are available for the practical evaluation of raw materials and product piloting and as basis for the plant process design (Basic Design Package).

To continuously improve the plant equipment and in particular the products, Pörner closely cooperates with the world's leading specialized system and component suppliers following the Anlagenbau 4.0 concept.

The particular focus on highly demanded special products was and is the basis for numerous reference plants. Pörner has thus the know-how to achieve high-grade product qualities – custom-tailored for the world market – and to design the respective plants for optimal output, energy efficiency, and environmental compatibility.

Proprietary technologies of the Pörner Group:

- Biturox® technology for bitumen
- Solvent Deasphalting (SDA plus)
- Solvent extraction
- Dewaxing/Deoiling
- Low Energy Polymer Dissolving (LEPD)
- Aromatics extraction: BTX
- Power-to-X/Biomass-to-X
- High-tech silicate of rice hulls

BITUROX®
BITUMEN OXIDATION TECHNOLOGY

BITUROX® BITUMEN PLANT ROSTOV

Customer: OJSC NZNP

Location: Novoshachtinsk, Rostov / Russia

Project:

- Biturox® bitumen oxidation plant for the production of road grade bitumen
- Two Biturox® reactors of 660.000 TPA capacity at continuous operation
- State-of-the-art off-gas treatment and heat recovery for optimal energy efficiency and environmental compatibility

With over 60 licenses granted and 40 years of practical experience in the design and construction of bitumen plants, Pörner is a global market leader in bitumen oxidation technology.

Wolfgang Heger, Pörner Sales International

GLOBAL MARKET LEADER IN BITUMEN PLANTS

Pörner is licensor of the Biturox® Process, the leading bitumen oxidation process for producing premium bitumen grades in modern refineries.

The Biturox® Process enables the production of high-quality bitumen from a broader range of crude oils and refinery feedstock using controlled oxidation.

This bitumen features improved thermal properties and aging resistance.

Pörner licenses designs, and supplies Biturox® plants on a turnkey basis based on customer requirements, including infrastructures such as tank farms, filling stations, packaging plants, etc.

In five decades, the Pörner Group has awarded more than 60 Biturox® licenses and put over 50 bitumen production plants into operation worldwide.

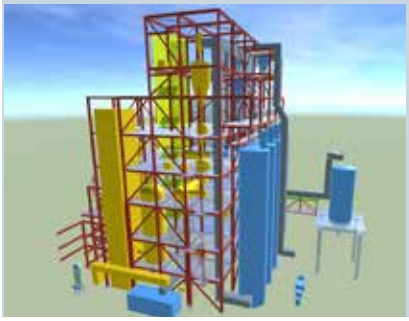
For example, the designed annual capacity of all Biturox® plants operated in India meets 80 % of the country's bitumen demand.

High-quality Biturox® bitumen binders enable to build high-speed roads with a significantly higher lifetime – and less bitumen consumption.

SYNTHESIS GAS FROM BIOMASS

Location: Delfzijl / Netherlands

Project:
- Construction of a 1 MW pilot plant for the production of synthesis gas
- Feedstock: torrefied waste and used wood
- Basis for upscaling to a 25 MW plant



HYKERO (E-KEROSENE) PLANT

Location: Böhlen-Lippendorf / Germany

Project:
- Project development for a plant for the industrial production of 50,000 TPA green PtL kerosene, green naphtha and green hydrogen
- Feedstock: Renewable electrical energy, sustainable carbon sources and water

We provide our customers with plants for production of sustainable, advanced fuels and base chemicals that show excellent GHG emission reduction rates, and create green solutions to significantly reduce the carbon footprint.

Mark Seper, Head of Process Engineering Pörner Vienna

POWER2X
EDL•TECHNOLOGY

GREEN ENERGIES AND CHEMISTRY

Climate neutrality, renewable energies, and sustainable business are the challenges of our time.

The Pörner Group supports the industry in improving its climate footprint and in the transition from fossil to renewable energies with sustainable Power-to-X and Biomass-to-X solutions for the generation of hydrogen and synthesis gas as a base material for the manufacture of synthetic fuels and basic chemicals.

From renewable electricity, biomass, and CO_2, synthetic products such as:

- hydrogen
- bio-methane, SNG
- methanol
- fuels (gasoline, diesel, kerosene)
- waxes/hydrocarbons

can be produced for the chemical industry.

Pörner sets the focus on the decarbonization of the aviation industry. Renewable jet fuel can be utilized climate-neutrally – with reduced consumption and emissions – without changing the infrastructure and the propulsion technology.

Green Economy

Based on its own patents and expertise, the Pörner Group configures complete BtX and PtX solutions together with leading technology partners for the following process steps:

- torrefaction of biomass
- gas purification
- methanization
- electrolysis
- synthesis gas
- Fischer-Tropsch synthesis
- distillation / processing

to produce biogenic fuels, synthetic gases, fuels, and basic chemicals.

Formaldehyde plant in Krems / Austria

Pörner designs, engineers and constructs plants for the formaldehyde technology family as an EPC contract partner incl. off-sites, utility and infrastructural facilities.

Gerhard Bacher, Managing Director of Pörner Grimma

FORMALDEHYDE
+ DERIVATIVES

COMPETENCE CENTER FORMALDEHYDE AND DERIVATIVES

Pörner operates a technological competence center for formaldehyde-based products at its Grimma office.

For more than 25 years, Pörner Grimma realized plants for the production of formaldehyde and its deriving secondary products for international customers together with specialized licensors and partners providing the required know-how.

Base product: Formaldehyde produced from methanol

In close cooperation with long-term licensing partner Dynea AS, Pörner continuously developed the Silver Catalyst Process for formaldehyde production to become the most advanced of its kind. The Silver Catalyst Process is the safest, most environmentally friendly, and resource-saving formalin process and impresses with its low energy and media consumption and a low-cost, 100 % regenerable catalyst. Technical and economic process comparisons and over 25 reference plants worldwide deliver proof of this.

Downstream products

From the base product formaldehyde, UFC, hexamine, POM, UF, MUF, MF, PF resins, novolake and bakelite can be produced.

Bio-Silicate demonstration plant in Freiberg / Germany

SILICATE
PÖRNER RICE HULL TECHNOLOGY

BIOLOGICALLY BASED VALUABLE MATERIALS

The Pörner Bio-Silicate Process

With the Pörner Bio-Silicate Technology, high-purity bio-silicates can be produced efficiently and in an environmentally friendly way for a wide range of applications. The patent-protected technology produces high-quality water glass for the global market from the ash of rice hulls.

Globally, rice production generates large quantities of rice hulls as biological waste. Increasingly, these are converted into climate-neutral electrical energy in biomass power plants, producing rice hull ash (RHA), which contains over 90 % silicon.

The Pörner Bio-Silicate Process produces high-purity bio-silicate from RHA by means of patented pre-cleaning, digestion with lye and subsequent separation of residual carbon. The novel process replaces conventional high-temperature processes based on quartz sand, which can reduce the CO_2 foot-print by around 70 %.

Applications of Pörner Bio-Silicates

- detergents and cleaning agents, construction adhesives, and cement
- paints and coatings
- pulp and paper processing, textile industry, ceramic industry
- pharmaceuticals and cosmetics
- water treatment
- fertilizers
- further processing to silica

Pörner operates a semi-industrial demonstration plant in Freiberg / Germany, where Pörner employees test ashes from all over the world if they are suitable for “green” silicate production and produce trial quantities for industrial applicants.

PRODUCED WATER TREATMENT PLANT

Customer: North Caspian Operating Company N.V.

Location: Atyrau / Kazakhstan

Project: Supply of a produced water treatment plant for subsequent re-injection into the reservoir with a capacity of 164 m³/h (expansion stage 1) and 82 m³/h (expansion stage 2);
Execution on behalf of Siemens

With the Pörner Water competence center, we support our customers in the process industry even better in implementing energy-efficient solutions and sustainably minimizing emissions from process plants.

Robert Vranitzky, Head of Pörner Water

River water treatment plant, Infraserv Höchst, Frankfurt a.M. / Germany

Photo: Infraserv Höchst

PÖRNER WATER

COMPETENCE CENTER PÖRNER WATER

Pörner acknowledges the importance of water as an increasingly limited resource in the industry.

From the idea to the realization, the Pörner Water Competence Center offers integrated solutions in new installations, extensions, or modernizations for water supply, treatment/recycling, and disposal.

The focus is on energy-efficient and resource-saving water supply (quantity and quality) and efficient disposal of process waste water based on the latest state-of-the-art technology while adhering to the highest safety and environmental standards.

Based on the experience from internationally realized reference plants and in cooperation with specialized technology partners, Pörner Water creates customized overall projects from a single source by optimally combining innovative water processes, systems and special components: from concept, engineering, procurement, and construction supervision to commissioning, training and predictive maintenance.

Pörner water treatment plants

For Pörner water treatment plants in the industrial sectors:

- Energy & environment (electrolysis,...)
- Oil/gas fields (on/offshore)
- Refineries
- Petrochemical industry
- Chemical industry
- Pharmaceutical industry

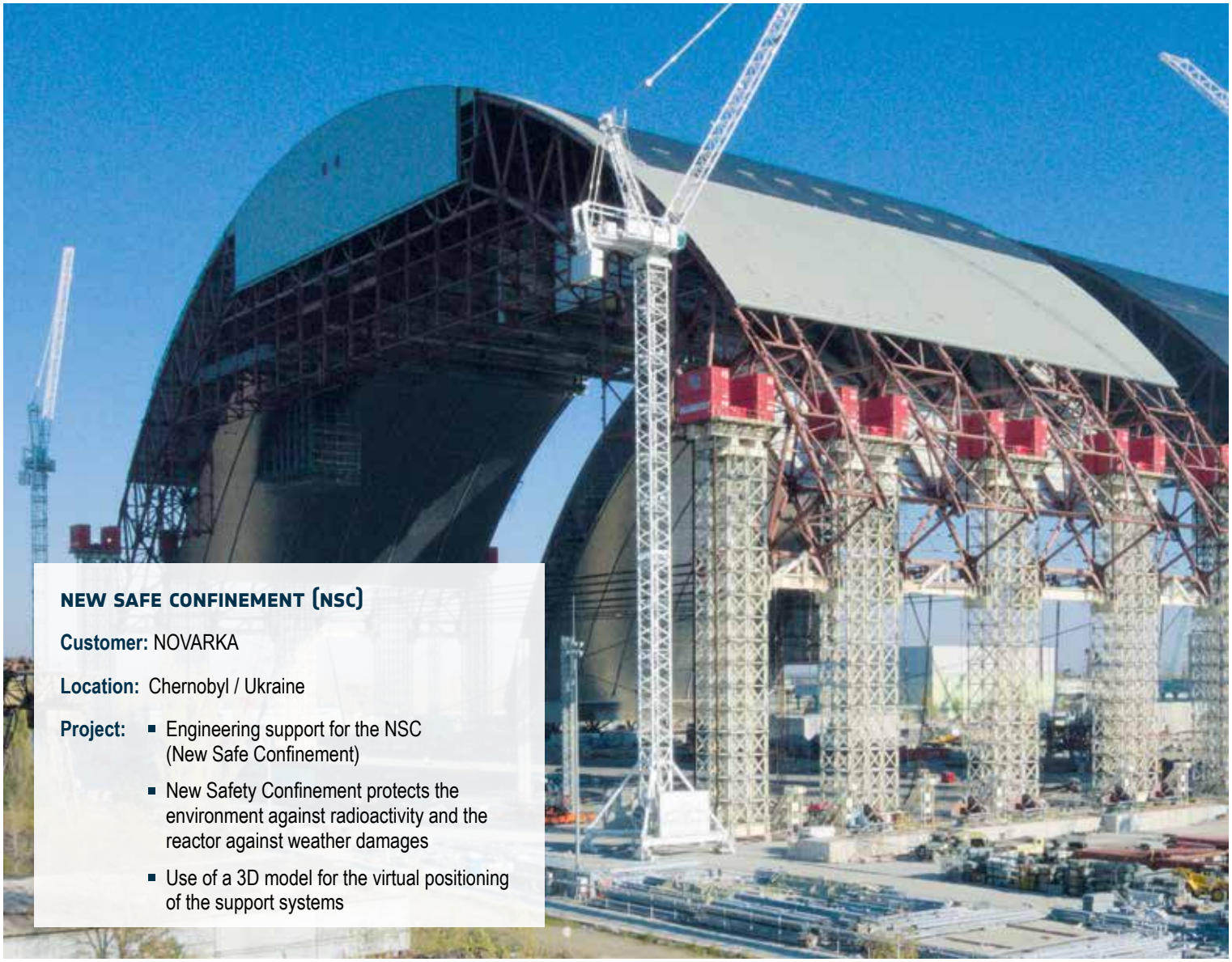
solutions for the following applications are provided:

- Surface water treatment
- Well rehabilitation
- Condensate purification
- Cooling water treatment
- Produced water treatment
- Wastewater treatment

QUALITY & CERTIFICATIONS

All Pörner locations have a TÜV-certified integrated quality and safety management system in accordance with EN ISO 9001 and further safety certificates - an essential condition to design and construct industrial plants in a reliable, safe, and environmentally friendly way.

Additionally, the Pörner Group has country-specific certifications outside the European Union, which entitles the Group to carry out engineering work, and construction and installation services according to local standards.



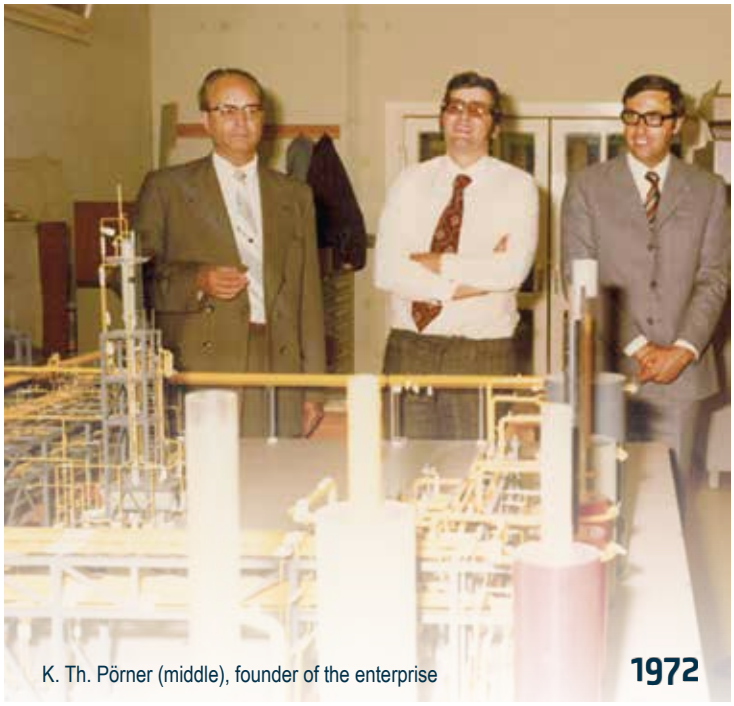
NEW SAFE CONFINEMENT (NSC)

Customer: NOVARKA

Location: Chernobyl / Ukraine

Project:

- Engineering support for the NSC (New Safe Confinement)
- New Safety Confinement protects the environment against radioactivity and the reactor against weather damages
- Use of a 3D model for the virtual positioning of the support systems



K. Th. Pörner (middle), founder of the enterprise 1972

Biturox® Start Up-Team 2022

50 years Art of engineering
1972-2022

FOR 50 YEARS IN THE PROCESS INDUSTRY...

... the Pörner Group has been a significant plant engineering company in Central Europe. The engineering network with ten locations offers to its industrial customers local presence combined with international expertise.

PÖRNER VIENNA
Head office, plants and units for refineries, petro-chemical and chemical industries, energy and environmental facilities, bitumen oxidation (world market leader) – Austria

PÖRNER LINZ
International plant engineering, plants for the steel and chemical sectors of industry – Austria

PÖRNER KUNDL
Pharma plant engineering and industrial building services – Austria

EDL LEIPZIG
Refinery and chemical plants, revamps, proprietary special technologies – Germany

EDL COLOGNE
Industrial production and infrastructure plants – Germany

PÖRNER GRIMMA
Chemical process industry, technology centre for formaldehyde and its derivatives – Germany

PÖRNER BURGHAUSEN
Refinery and chemical plants, energy and environmental plants – Germany

PÖRNER KYIV
Gas and liquefied petroleum gas facilities onshore and offshore – Ukraine

PÖRNER ROMANIA
Refinery equipment, petrochemical industry, power and environmental systems, general plant engineering – Romania

THERMISCHE APPARATE FREIBERG
Engineering and manufacturing of special equipment and pilot plants (BtX) – Germany

PÖRNER GRUPPE

TECHNOLOGY
ENGINEERING
CONTRACTING

PÖRNER INGENIEURGESELLSCHAFT MBH

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