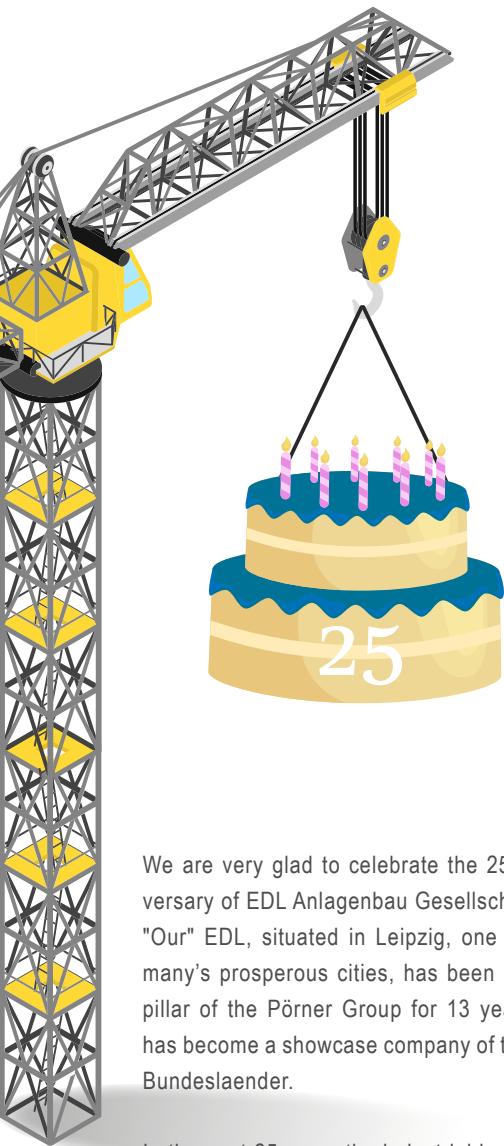


# 25 YEARS



# GREETINGS FROM THE SHAREHOLDERS



We are very glad to celebrate the 25<sup>th</sup> anniversary of EDL Anlagenbau Gesellschaft. "Our" EDL, situated in Leipzig, one of Germany's prosperous cities, has been a major pillar of the Pörner Group for 13 years and has become a showcase company of the New Bundeslaender.

In the past 25 years the industrial landscape in Germany and Europe has changed tremendously owing to increasing globalization. The worldwide process industry has been facing a lot of new challenges as a result of the low oil prices, energy turnaround and crises in important markets.

## CONTENTS

25 YEARS EDL .....	2
FACTS AND FIGURES .....	4
TECHNOLOGY PORTFOLIO .....	6
PROJECTS .....	12
QUALITY CREATES CONFIDENCE .....	16
CORPORATE CULTURE.....	19

### LEGAL INFORMATION

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EDL Anlagenbau Gesellschaft mbH  
Lindenhaler Hauptstrasse 145, 04158 Leipzig, Germany  
Tel. +49 341 4664-0, Fax: +49 341 4664-409  
Email: [gff@edl.poerner.de](mailto:gff@edl.poerner.de); [www.edl.poerner.de](http://www.edl.poerner.de)  
Managing Directors: Dr. Michael Haid, Wolfgang Kursch  
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Added to that, more and more engineering services are outsourced to newly industrializing countries, and so there are only few larger plant engineering firms left in Germany. In this environment EDL Anlagenbau Gesellschaft has built a strong position as engineering partner for plant engineering projects in the refinery, petrochemical and chemical industries.



**Three key factors** have doubtlessly contributed to EDL's success:

1. **Closeness to customers** – by meeting the specific requests and requirements of customers EDL has become the trusted partner of large industrial enterprises.
2. **Experience and expertise** – gained by working with renowned customers in the German-speaking world (EDL has worked with all German and Austrian refineries). The reference plants shown in this brochure are impressive evidence of it.
3. **Formidable commitment of the EDL staff** – teams of innovative, flexible and reliable engineers and specialists of all disciplines, equipped with the most advanced tools, are capable of tackling practically all tasks of plant engineering and thus creating unique plants.

All this results in the motto of "that certain plus" which has been offered by EDL for 25 years and makes the decisive difference both for investors and end users when it comes to the project execution, quality and productivity of a plant. The engineers of EDL always keep pace with the technological developments and are therefore well equipped for the future.

The list of EDL customers reads like a Who's-Who of the process industry. They all appreciate EDL's high process competence and top-quality engineering services all from a single source.

The challenges to the art of engineering are not on the decrease but rather the increase. New products need to be made cost-efficiently and new processes need to be im-

plemented in an energy-efficient and environmentally friendly way. EDL executes such projects in a budget-friendly manner within a minimum time frame and with the shortest possible interruption of operation.

On the occasion of this anniversary we would like to thank all those who contributed to the company's success:

- our industrial customers who have placed their trust in us with major projects;
- the partners, suppliers and contractors of the plant construction industry for their cooperation;
- and above all, the employees of EDL meeting the day-to-day challenges of process plant engineering, planning, design and construction of projects from A to Z to create sustainable and highly efficient plants.

We wish all of you many interesting projects in the next 25 years, pleasure of working together and great technical and commercial success in Europe and elsewhere.

**Andreas Pörner and Peter Schlossnikel,**  
*Managing Shareholders of the Pörner Group*

# 25<sup>TH</sup> ANNIVERSARY OF EDL



This past quarter of a century has been a busy and exciting one, with ups and downs, success and defeats, fast-paced developments and changes. Therefore, it fills us with pride that from its foundation in 1991 EDL could firmly establish itself with professional competence and reliability. We are pleased that its typical creativity and flexibility has enabled us to make a name for ourselves in the refinery and chemical sectors as a strong, reliable and innovative plant engineering contractor, not only on the domestic market but also more and more on a global scale. The most important part of this development has been our employees, who added to our reputation with passion, commitment and diligence. This is why they deserve credit first and foremost for their contribution through all these years.

Sincere thanks also goes to our shareholder, Pörner Ingenieurgesellschaft mbH based in Vienna. This relationship is based on partnership, mutual respect and willingness to succeed together. Thanks also to all our customers and business partners for the long-term cooperation borne by the reliance on our skills and competences.

But resting on our laurels is not what we want to do. We plan to create sustainable value for our customers not only as renowned revamp specialist but also by custom-tailored project developments and innovative technologies. To this end we have been advancing our technology portfolio, strengthening our existing technology partnerships and improving our own performance.

We are looking forward to exciting projects and new challenges, we remain open for new things and will keep on aiming for the perfect project for our customers. We have the required qualifications so, let's move on to shape the future together.

**Dr. Michael Haid**  
CEO of *EDL*

## FROM ZERO TO ONE HUNDRED

It was a launch from zero to one hundred when EDELEANU GmbH Leipzig was founded on 1 September 1991 right amidst the stormy times of transition. At that time the company was structurally part of the Essen-based RWE Group through EDELEANU and NUKEM.

95 employees who all learned the engineering business and who grew up at the engineering company of Chemieanlagenbaukombinat Leipzig/Grimma, constituted the first team. New market conditions, new laws and standards, different corporate structures, new tools and ways of working, stricter framework conditions in contracts and much more had to be implemented immediately in ongoing projects. A grace period could not be granted.

Today, 25 years after the foundation of today's EDL Anlagenbau Gesellschaft mbH we can proudly state that we not merely asserted ourselves on the market but gained a respected position as a competent and reliable partner of refineries and the chemical industry national and abroad.

Today EDL has a well-trained and motivated staff of 150 in Leipzig and is firmly integrated in the globally acting Pörner Group.

From an engineering office solely providing partial services for projects we have risen to an independently acting engineering contractor that has all the skills and competences to implement industrial projects in their entirety and we offer engineering services and project execution from a single source.

For quite some time we have been investing in the development of proprietary technologies to provide cutting-edge and custom-tailored solutions for demanding process requirements. We are now in the position to offer complete solutions and continue to be attractive for our regular as well as new customers. We will keep going this way for the future of EDL, for the next 25 years.

**Wolfgang Kursch**  
Managing Director of *EDL*



# FACTS AND FIGURES OF EDL

## FOUNDATION

Foundation of the wholly owned RWE subsidiary EDELEANU GMBH Leipzig with employees of the former Chemieanlagenbaukombinat Leipzig-Grimma (CLG)

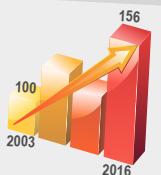
1991

## EDELEANU-EDL

Spin-off of EDELEANU-EDL GmbH Leipzig

2001

Since the acquisition by the Pörner Group, the number of staff has risen by over 50 % from almost 100 to 156 employees.



## PÖRNER



EDL becomes a subsidiary of the Pörner Group. Continuous development to become an international technology provider and revamp specialist.

2003

## FIRSTS



First engineering project in the Ukraine

First delivery contract to Azerbaijan

First order from Iran for a study

2010

The average age of EDL staff is

47  
YEARS

1998

## NEW COMPANY



Merger with the parent company in Alzenau

2002

## NAME

Change of name into EDL ANLAGENBAU GESELLSCHAFT MBH



2007

## REFINERY

Construction of the C<sub>3</sub> splitter at the PCK Raffinerie GmbH Schwedt, with 84 m the highest building in the region



**33 %**  
of the EDL team  
are women



## REFINERY

Revamp of the vacuum distillation column  
including conversion to the deep-cut mode,  
PCK Raffinerie GmbH, Schwedt



**Percentage of staff by disciplines:**  
process technology: 22 %  
mechanical / equipment: 7 %  
layout / civil / steel construction: 7 %  
electrical / instrumentation: 12 %  
piping: 21 %  
project management / procurement / expediting & estimating: 13 %

## CHEMICAL INDUSTRY



Contract award for the  
construction of 2 chemical plants  
in Germany

**90%**

Over 90 % of EDL employees  
are graduates of universities  
and senior technical colleges,  
80 % have over 10 years of  
work experience

## 2013

## 2012

## PROJECTS

Contract award for the  
construction of 2 HDS plants for  
Tatneft (Russia)

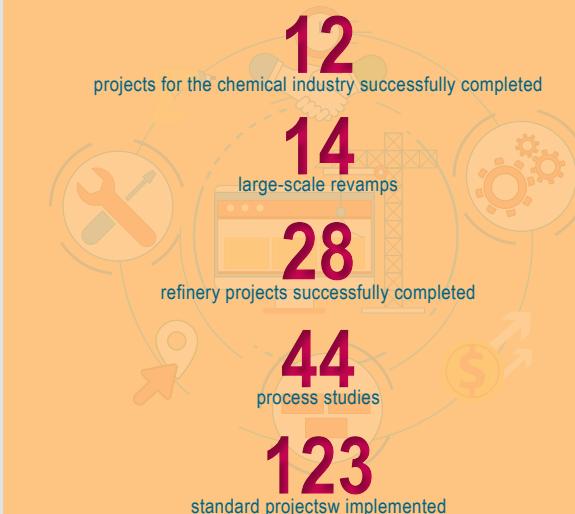


Commissioning of SDA pilot  
plant in Leipzig (Germany)

3 contracts with TOTAL Raffinerie  
Mitteldeutschland GmbH in Leuna  
(Germany)



## IN THE LAST 5 YEARS



## 2015

## 2014

## TECHNOLOGY

Commissioning of dewaxing/  
deoiling pilot plant in Leipzig



First delivery order for the  
Republic of Belarus



## 2016

## REVAMPED BY PÖRNER GROUP

4 revamps for PCK in Schwedt  
successfully completed

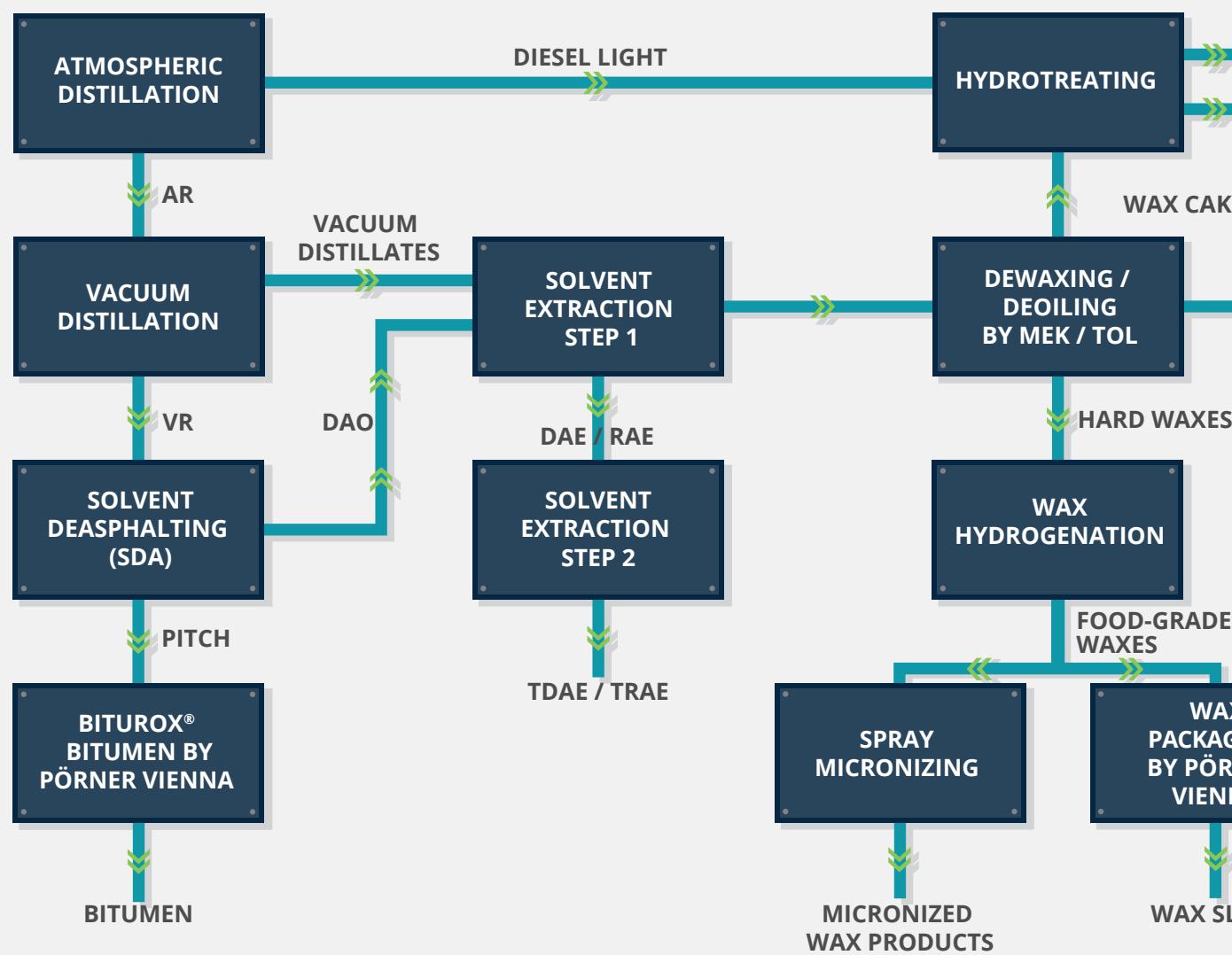
3 revamps for OMV in Schwechat  
successfully completed

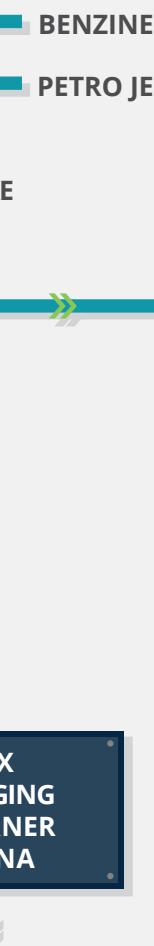


# EDL TECHNOLOGY PORTFOLIO

Since 2008 EDL has constantly been improving its process know-how by own technologies. Customers do not only buy from EDL engineering, procurement and supervision services as a package but also relevant technologies and process consulting services.

These technologies are designed for a better and sustainable processing of refinery residues and manufacture of high-quality products in great demand on the world market. In addition, they make a positive contribution to the responsible use of natural resources.





EDL's current technology portfolio and process know-how cover the following areas:

- Solvent deasphalting
- Solvent extraction
- Dewaxing / deoiling
- Base oil hydrogenation
- Hydrogenation of white products
- Lube oil blending
- Wax packaging
- BTX aromatics extraction
- Deploymerization
- Used oil re-refining

*„EDL thus provides for lubricant refineries a consistent process chain from distillation through to the end product.“*

Dr. Michael Haid,  
CEO of EDL



## Solvent Deasphalting – SDA

*"One of the most interesting bottom-to-barrel technologies as economic solution for the processing of heavy oils and residues is solvent deasphalting."*

Jan Schwartz, Head of EDL Technology Department



Propane deasphalting plant (PDA), H&R Ölwerke Schindler GmbH,  
Hamburg / Germany

This process applied by lube refineries is now more and more used by fuel refineries because the investment costs are considerably lower than those of other residue processing technologies (hydrocracker, coker, visbreaker etc.).

The necessary process parameters and the optimum process conditions are reliably determined at EDL's pilot plants.

Heavy residues (vacuum, visbreaker, hydrocracker residues, heavy used oil, refinery residues (bunker oil), FCC residues (heavy recycle oil)) are extracted by means of solvents, such as propane, and split into DAO (deasphalted oil) and a

pitch (asphalt). Fuel refineries can process the DAO, e.g. in hydrocrackers, FCC and refining plants to become gasoline, diesel or fuel oil components. Lube refineries use the DAO as bright stock for the production of lube oils.

### Combination of SDA and Biturox® plant

The bitumen-capable pitch produced in an SDA plant can be processed to high-quality road bitumen after aromatic oils have been added to a Biturox® reactor. With its Biturox® process the Pörner Group is market leader in bitumen production plants and has recently granted the 50<sup>th</sup> license.

## Solvent Extraction



EDL determines the necessary parameters on its own test stands to adjust and convert existing plants.

This method is used to extract high-quality lube oils from vacuum distillates and deasphalted oil (DAO) from the SDA process. These side products were mainly used as softener and tender oil.

The tender oils, such as distilled aromatic extract (DAE) and residue aromatic extract (RAE) previously used by the tire industry are now strictly prohibited because the polycyclic aromatic hydrocarbons (PCA) are classified as highly toxic (carcinogenic, mutagenic and reprotoxic) by the EU Directive 2005/69/EC, and the share of PCA in softeners has to be less than three percent.

To meet the required limits, the high PCA amounts of the extracts can be separated

by employing a further extraction stage. It is then possible to obtain Raffinate Treated Distilled Extracts (TDAE) and Treated Residue Extracts (TRAЕ) from the DAE and RAE extracts.

### Benefit for the customer

This double extraction technology makes it possible to produce environmentally friendly tender oils, which have more benefits to offer as to the tire quality.

Solvent extractions can be converted to the use of the solvent NMP thus replacing the ecological harmful solvents (phenol and furfural). In addition, it is possible to increase the production capacity by using advanced extractor internals and specific engineering solutions.

## Dewaxing / Deoiling

*„Paraffins obtained from deoiling are high-quality products used, for example, in medicine, pharmaceutical, packaging or building material industry.“*

Jan Schwartz, Head of EDL Technology Department

Advanced processing methods (e.g. catalytic cracking) reduce the number of side products, such as aromatic hydrocarbons



Dewaxing / deoiling pilot plant in Leipzig / Germany

or paraffins/waxes. The lube and paraffin producers are thus forced to find new, more efficient technologies since increasingly efficient industrial plants require lubricants of higher quality.

For the dewaxing/deoiling process both a solvent-free process and a solvent process or a combination of both can be used. In cooperation with Sulzer Chemtech, Winterthur (Switzerland) EDL offers all three types depending on the specific qualities of the feedstock.

### Benefits for the customer

Selecting the optimal technology for the customer ensures that the best product qualities are achieved. Besides lower

investment and operating costs, lower emissions and less residual products are attractive for refinery owners. Another financial advantage: plant upgrades and capacity expansions can be done with no need to interrupt production.

### Efficient combination of processes

The combination of the two processes (two independent lines) provides the following advantages compared to the conventional solvent technology:

- considerable cost savings (investment and operating costs)
- much higher product yields
- heat integration of the plant to save energy.

## Hydrogenation of Base Oils / White Products

*„Hydrogenation processes are used to adapt the properties of the end products to the next process steps or the specification of the commercial products.“*

Dr. Thomas Krumsdorf, EDL Technology Manager

The requirements for hydrogenation plants at refineries are very versatile. They comprise the removal of heteroatoms, such as sulfur, nitrogen and oxygen, if necessary, the change of substance properties with the aim to reduce the boiling range and density or even fundamentally change the substance groups contained in the feedstock. Combinations of different requirements are possible.

The lube refineries preferably use the following processes:

- Hydrotreating/Hydrofinishing to produce technical and medical white oils
- Hydrofinishing to produce bright stock
- Hydrotreating and selective hydrogena-

tion to produce base oil API Groups II, III

- Hydrotreating of slack wax to produce petro jelly
- Hydrotreating to produce food-grade wax.

The basic concepts of the above mentioned processes differ in operating parameters (pressure, temperature, catalyst load and the gas-to-oil ratio) and the catalyst systems used. When selecting the operating parameters regard must be given to the feedstock and target product qualities, reaction enthalpies and plant run times. As to catalysts sulfidic Ni/Mo or Co/Mo catalysts are used primarily.

Catalyst poisons present in the feedstock may require additional guard systems to ensure a catalyst run time of up to 36 months.

### Benefits for the customer

A hydrogenation plant allows a substantial growth in added value by a larger product range and its value by selecting the hydrogenation process in accordance with the prerequisites (ISBL and OSBL) and the market requirements.



HyLube II plant, Puralube GmbH  
Elsteraue / Germany

## Lube Oil Blending

*„Since 2012 EDL has been investing in the lube oil blending technology. Lubricants comprise for example, engine, transmission and industrial oils but also cooling lubricants and antifreeze agents.“*

Marcel Schicht, EDL Technology Manager



From the process point of view the production techniques are relatively simple but the design of the entire plant to the customer's product portfolio needs the ability to deal with sensitive issues. EDL provides services from the study through to commissioning as a full package worked out together with the customer.

Core equipment, such as ABB (automatic batch blender), ILB (inline blender), SMB (simultaneous metering blender), DDU (drum decanting unit), matrix manifolds,

piggable piping and advanced instrumentation meet the versatile blending requirements of customers.

### Benefits for the customer

All pieces of the core equipment are delivered skid-mounted thus very much facilitating their integration into the existing plant and reducing the installation costs and times at site substantially. In addition to this the module prefabrication in Germany meets highest quality standards.

As a highly automated system the „world scale“ lube oil blender generates 30 to 40 batches per day, GS Caltex Corporation, Seoul / Korea

## Wax Packing (Spray Micronizing)

*„Spray micronizing produces waxes in the form of round particles.“*

Dr. Thomas Krumsdorf, EDL Technology Manager

Micronized waxes are used in various ways, such as the production of printing inks, floor care products, cosmetics, packaging coatings, timber and powder varnishes.

If the particle sizes of 20 – 50 µm required for that purpose are made by pulverizing, it is only possible at high energy expenses. The particles produced this way have

no uniform shape and are therefore limited in the range of applications.

Micronizing is an alternative to pulverizing. The round particles are generated by atomization of liquid waxes and subsequent cooling in a nitrogen stream. The spray tower as the heart of the plant accommodates spray nozzles with two-fluid nozzles with internal mixing and pre-chamber having turned out to be suitable.

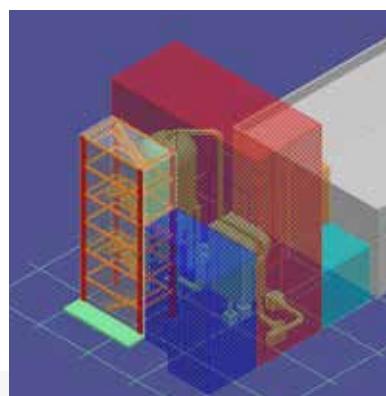
Essential for the grain size obtained are

the material properties of the molten wax at process temperature.

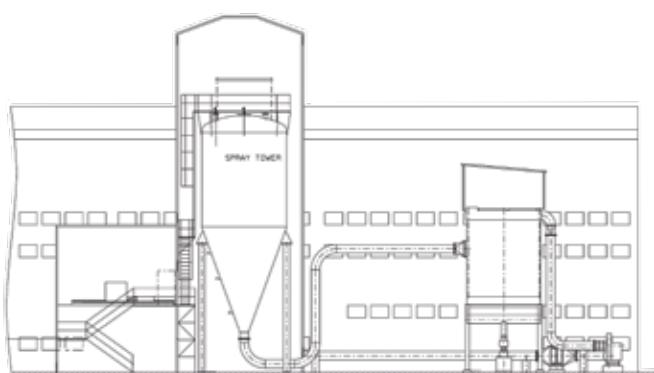
By varying the ratio of wax and gas it is possible to additionally influence the droplet size achievable.

### Benefits for the customer

Micronizing opens up new and extended applications for special waxes. Also less energy is needed than for comparable processes.



Model of a spray micronizing plant



## BTX Aromatics Extraction

„The EU Auto-Oil program 2010 limits the benzene content of gasoline to <1 % vol. and the aromatic hydrocarbons content to a total of < 35 % vol. This is, why plants, especially those producing BTX aromatics, have become the focus of attention again.“

Dr. Rolf Gambert, Head of EDL Process and Technology Division

At fuel refineries BTX aromatic hydrocarbons (benzene, toluene, xylene) are mainly produced in a reformer using the reformed gasoline. To separate the BTX aromatics at the reformate splitter, EDL has developed an innovative divided wall column solution. Its

economic efficiency has been clearly demonstrated by a study for a renowned refinery in Germany.

The aim of a BTX extraction is the production of high-purity aromatic hydrocarbons from a feed consisting of aromatics and non-aromatics. The BTX aromatic cuts produced are provided in a BTX aromatics extraction usually as superpure substances (benzene, toluene, m-, p- and o-xylene) for further processing in petrochemistry.

In most of the BTX extraction plants aromatic hydrocarbons are obtained in a liquid-liquid extraction column and purified in an extractive distillation column. To separate the aromatic hydrocarbons from the solvent, steam is used as stripping agent. In this process solvents of different polarities, such as sulfolane (high polarity) and diethylene glycol

(DEG) / triethylene glycol (TEG) (low polarity), are used. To apply the process of aromatics extraction in practice, EDL has teamed up with the US firm TTC Labs. Inc. Fond du Lac (WI) that prepares the pre-basic engineering and acts as process provider.

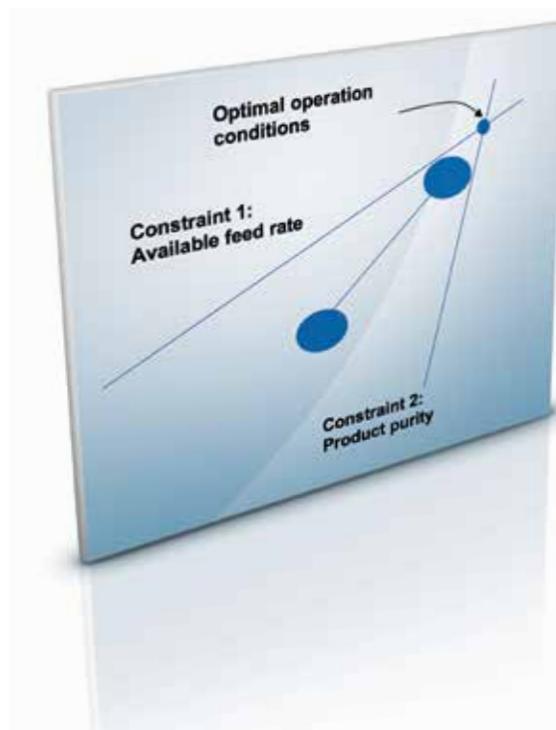


### Benefits for the customer

Besides products of high quality and high yields this technology helps to save energy between 10 and 50 %, ensures a more stable mode of operation, less corrosion problems and also a cost-efficient and better process control.

Existing plants can be retrofitted in a budget-friendly manner for a higher throughput by selecting a more efficient solvent (EG, DEG, TEG, TTEG).

## Advanced Process Control (APC)



To optimize the plant operation, EDL teams up with partners to offer solutions for advanced process control (APC) that improve the reliability and safety of technological processes and save energy and costs of sizable amounts and increase performance and quality at the same time.

The APC concept of EDL comprises four levels to optimize plants:

1. Optimization of all control systems
2. Statistical optimization of all control systems
3. Complete plant optimization with specific target figures

4. Complete plant optimization and implementation on ERP level

### Benefits for the customer

- Higher throughputs (1 – 5 %)
- Increase in quality parameters of the products (2 – 10 %)
- Less specific energy consumption (3 – 10 %)
- Faster and more efficient commissioning (10 %)
- Major reduction of maintenance costs
- Payback time for APC is between 3 to 12 months

# EDL – THE REVAMP SPECIALIST

## Experience from over 45 large-scale projects

Refinery revamps always constitute a major challenge – both for the plant owner and the engineering contractor. Complex refurbishments within a minimum of time during shutdowns do not only require a lot of experience but also accurate prepara-

tion. This is where the engineers of EDL as real revamp specialists come in with their expertise and know-how. Looking back to over 45 successfully completed large-scale projects EDL has become a specialist for plant revamps in refineries.

The implementation of refurbishment projects gives the customers a long-term added value because market requirements can be met in a better way and competitiveness restored or increased within a short time.

## Four revamp projects during PCK shutdown „kleiner 16“ successfully completed



The ability as a revamp specialist was most recently demonstrated by EDL in April 2016 when the TÜV shutdown "kleiner 16" took place at PCK Raffinerie GmbH Schwedt.

### Revamp of Crude 1 and FCC plant

In spring 2015 EDL was entrusted by PCK Raffinerie GmbH with the replacement of the vacuum column (3,200 / 8,500 / 7,000 mm diameter, total length about 61 m, total weight about 760 MT) in the Crude 1 plant. The scope of work comprised of the basic and detail engineering

packages, procurement as well as construction and erection supervision. The detail engineering and procurement activities for the replacement of the regenerator of the FCC ran parallel to it. For this project EDL was also in charge of construction and erection supervision.

To round off the work package for the complex 2016 shutdown, EDL provided services at the Crude 1 plant for the replacement of a stripper column and the LCO recovery project at the FCC plant.

### Master logistical performance for the regenerator replacement

The regenerator replacement project was once more a huge challenge in terms of logistics. Along the refinery roads plenty of pipe bridge crossings were to be crossed and pipe routes overbuilt for the oversize regenerator components (16 m long and up to 9.5 m in diameter). The temporary drive-over bridges (16 and 25 m long) provided with 30 m long ro-ro ramps took two months for construction using 100 m<sup>3</sup> concrete and 1,400 m<sup>3</sup> mixed gravel before the four regenerator components (each weighing up to 270 MT) could be moved over the 2.20 m high bridges. It was a very impressive structure that was stripped down afterwards.

The entire regenerator section split into five heavy-weight lifts was dismantled within eight days. During this time all peripheral installations were removed. To this end separating cuts were made at the regenerator. The upper and lower sections of it were

lifted, placed onto temporary foundations, the air pre-heater moved hydraulically and lifted, the existing reinforced concrete table cut apart, lifted in two parts and then carried away using a self-propelled modular transporter (SPMT). The weights to be moved were impressive: upper section 219 MT, lower section 230 MT, two-part reinforced concrete table 225 + 207 MT.

The reinstallation of the new regenerator section was done in four parts. To meet the ambitious time schedule the regenerator table pre-assembled as a module (16.5 x 11.5 x 9.2 m weighing 168 MT) and the piping that was 80 % complete were lifted by the 1,800 MT main crane into the plant. Then, the new, also pre-dressed regenerator components (lower section 290 MT, upper section 370 MT) were put in place and the periphery complemented.

One of the biggest problems to tackle was the narrow space. It could only be managed by the prior well-planned exact sequence of the lifting, placing and shifting of old and new components in conjunction with the weight-dependent crane conversions.

Parallel to the regenerator activities the heat exchanger module (10 x 10 x 5.6 m, 80 MT) that came 95 % pre-dressed with piping, electrical systems and instrumentation as a ready-made structural steel module was lifted into the plant and connected.

On 24<sup>th</sup> April 2016, EDL project manager Holger Linke announced: "The mechanical completion records for the "Regenerator



Lifting of the central section of the vacuum column 1K6

"Replacement" and "LCO Recovery" projects of the FCC plant were signed by the customer."



Regenerator section (16 m long, 9.5 m diameter) moving over a temporary bridge

### Crude 1 plant: optimized prefabrication with 16 modules

The project manager Holger Linke stated with hindsight: "As in all current projects of PCK the modular building system was employed requiring parallel to the planning of the complete plant an in-depth detailed scheduling of the dismantling and installation activities during the shutdown. When it came to the vacuum column 1K6 over six months – from July to December 2015 – 16 individually prefabricated shell sections were supplied by water and road. They were welded together in a dropout area specifically provided with foundations, and complemented with internals and attachments, such as steel platforms, piping and electrical equipment and instrumentation. The dropout area was also used to prefabricate a new stair tower in form of four structural steel modules. As usual it requires a detailed planning in a very early phase of the project because, once at site everything must fit. In the end we always managed it. It is something we can be proud of."

### Activities during shutdown

The beginning of the shutdown was the go-ahead for the well-planned dismantling and installation activities for the vacuum

column 1K6 and stripper column 1K3 in rapid succession:

**4<sup>th</sup> April 2016:** Dismantling of piping from the columns 1K3, 1K6 and the pipe racks, first separation cut at the column 1K6, preparation of the existing foundations for new equipment.

**7<sup>th</sup> April 2016:** Putting in place the completed new column 1K3 and mounting on the foundation, putting in place the new transfer line (DN 1,800 / old DN 1,200) between the furnace 1V2 and the new column 1K6.

**10<sup>th</sup> April 2016:** On-schedule lifting of the new lower section of the 1K6 and first staircase module. Then, the column components and staircase modules were installed in turns.

**26<sup>th</sup> April 2016:** Gas pressure test of column because of the delivery in parts (compression of approx. 2,500 m<sup>3</sup> in total at a test pressure of 4.4 bar and a two hour holding time), test of 175 flange connections for tightness – result: Passed.

**27<sup>th</sup> April 2016:** Signing of gas pressure test certificate.

**29<sup>th</sup> April 2016:** Handover of the Crude 1 plant including the new vacuum column.

### Successful and anything but "klein"

Although the shutdown was named "kleiner" (small), it was the EDL scope of work alone that made it VERY big – see infobox. EDL and its client PCK and the subcontractors can be proud of having completed these four revamp projects on time, within the agreed budget, optimal quality and without any accident.

But the best recompense for the planner is a satisfied customer who appreciates the achievements.

*.... Thank goes to all colleagues, who have contributed to this success and the colleagues of the partner companies, who in any wind and weather over four weeks dedicated themselves to the PCK-*

## PROJECT INFORMATION

### Shutdown period:

4<sup>th</sup> to 30<sup>th</sup> April 2016

### Facts of the 4 EDL projects:

- 700 MT equipment dismantled
- 1.000 MT new equipment installed
- 500 MT steel structures built in
- 2.300 MT concrete and 1,900 m<sup>3</sup> recycling material used for crane hardstand
- 71 m ridge height makes the Crude1 plant to one of the tallest structures of the refinery

*TÜV project with diligence, determination, discipline and with the necessary fun. It was a pleasure to work with service providers, who are brilliant. ...“*

*(Josef Maily, PCK Managing Director and Thomas Schulze, Shutdown Manager of „kleiner“ in a special edition of Märkische Oderzeitung)*



1K6 column and staircase modules installed just before completion

# Finalized: Three major revamps in the 2016 OMV Turnaround

To finalize three major revamps at almost the same time, constitute a challenge in terms of engineering, process and above all planning. The engineers of two sites of the Pörner Group brought in their assets and know-how – those from Vienna the project management, knowledge of the site and closeness to the customer, and those from Leipzig their process competence, long years' experience as revamp specialists in the planning, installation preparation and logistics for plant refurbishments. Taken together it meant an optimized project structure providing the customer with an efficient and custom-tailored concept of project execution.



Peter Schlossnikel, Managing Shareholder of the Pörner Group, Christian Jüttner, OMV Asset Development Manager, Dr. Michael Haid, CEO of EDL and Christina Pötzsch (EDL), observe the project progress at the refinery site in Schwechat.



Also in April 2016 the turnaround (TAR) 2016 took place at OMV in Schwechat (Austria). The Pörner Group implemented three of the five large-scale projects.

## Reactor replacement at desulfurization plant HDS3

A central aspect of the TAR 2016 was the integration of the new reactor, designed for 465 °C at 80 bar, of the hydrodesulfurization plant HDS3 into the existing plant configuration and the safety concept. The scope of work included the FEED, detailed engineering (prepared in just four months), procurement, construction and erection supervision and assistance in commissioning.

After two years of preparation a special transport was arranged in mid-June 2015 to carry the reactor being 25 m in height and weighing 382 MT from Alberner Hafen in Vienna to the nearby refinery. This kind of transport required a number of special logistic measures, such as bridge reinforcement, closure of motorway, arranging a temporary exit etc.

At the refinery it was also not an easy job since the reactor had to pass under a pipe

rack with a clearance of just 8 cm. The reactor was raised by means of a purpose-made gantry crane.

On 22<sup>nd</sup> April mechanical completion of the HDS3 plant was announced on schedule and shortly afterwards the plant started producing on spec.

## Refurbishment of DEA2 and RD4 plant

At about the same time as the HDS3 plant the DEA2 and RD4 plants underwent refurbishment to improve the product yield and plant operation. The Pörner engineers from Leipzig and Vienna provided EPCM services for both projects which were preceded by the FEED in 2012.

At the DEA2 plant columns, roughing filters and filter water separators were replaced, an additional fresh amine cooler and control valves installed in the steam line.

At the crude oil distillation plant RD4, the heart of the refinery, the aim was to stabilize the entire gasoline from the main column and pre-flasher to improve the yield and optimize the plant operation. This project was a typical example for the Pörner team to demonstrate its flexibility to handle pro-

jects even under short lead times since the customer asked not until late November 2015 for the implementation of further parts of the FEED prepared in 2012 during the 2016 TAR. There was not much time for the process engineers to check and design ac-



An uplifting experience: the new HDS3 reactor is raised and set on the foundation without readjusting.

cordingly the impacts of the projects already initiated and the changes resulting from it. The two plants were successfully integrated so that mechanical completion could be reported on 29<sup>th</sup> April.

High & Heavy: Transport of the 25 m high and 382 MT heavy reactor on the A4 motorway near Vienna.



.... To master successfully projects from planning to operation, within necessary tight framework conditions, under enormous cost and time pressure, we need reliable and flexible partners. In EDL / Pörner with their committed and solution-oriented staff, we obviously got such a partner! I would like to thank for the excellent project performance and the professional as well as human cooperation that made our joint revamp projects a complete success."

Heinz Kirschbichler, Senior Project Manager of OMV

## Two hydrodesulphurization plants for TATNEFT



The construction and mounting of two HDS plants is currently in full swing within the refinery and petrochemical site in Nizhnekamsk

The contract concluded in late 2012 for the planning of two new hydrodesulphurization plants for kerosene and diesel at Nizhnekamsk, Russia, Republic of Tatarstan had been the largest order so far for EDL. The client was the joint stock company TATNEFT based in Almetyevsk.

The scope comprised the entire detail engineering and procurement and – in a separate contract – field supervision during

implementation.

The two HDS plants are part of a construction project within the refinery and petrochemical complex at Nizhnekamsk, about 1,100 km east of Moscow in the Republic of Tatarstan. This republic is one of the economically most successful regions of the Russian Federation. The location where crude processing and petrochemistry are at home for almost 50 years is constantly extended.

The time schedule alone was a major challenge. In a period of just three years the processes of two different licensors were implemented. Russian norms and regulations always holding surprises in store, the aspect of foreign language and the incorporation of local Russian and Ukrainian subcontractors were not an easy job for the team. Of special importance for the Pörner Group was the transnational cooperation. People from three different countries worked together in this project: besides Leipzig-based EDL



Planning of two hydrodesulphurization plants for diesel and kerosene

(focusing on process, machinery/apparatuses, procurement, project management and coordination of the external partners for electrical/instrumentation and civil/structural disciplines) Pörner Linz (assisted by Pörner Vienna) with administration and PDMS model processing were involved. EDL Engineering in Severodonezk, Ukraine was in charge for the planning and design of the installation of the measuring and control equipment.

In the course of the planning process it turned out to be favourable that the piping engineers from Linz worked together with the EDL team in Leipzig. It created an additional win-win situation since the EDL team could make itself familiar with the new subject matter of PDMS much faster and the Linz team could benefit from the numerous tips of the refinery-experienced colleagues from Leipzig.

To manage the big piping package, staff from our Kiev-based 'sister' Gazintek was additionally involved in the project.



Cross-border cooperation of three countries did not only good to the project progress but was also an opportunity to make new personal contacts.

In the current implementation phase field supervision is done again by teams from Leipzig, Severodonezk and by a subcontractor from Kharkov.



# QUALITY CREATES CONFIDENCE

LEUNA-Harze GmbH - Am Haupttor - Bau BH18 - D-06237 Leuna

EDL Anlagenbau Gesellschaft mbH  
Lindenthaler Hauptstraße 145  
04158 Leipzig

Leuna, 15.06.2016

Sehr geehrte Damen und Herren,

wir möchten die seit 1996 bestehende Zusammenarbeit unserer Firmen zum Anlass nehmen, um uns für die angenehme Zusammenarbeit zu bedanken und Ihnen und dem ganzen EDL-Team gleichzeitig herzliche Glückwünsche zum 25-jährigen Bestehen von EDL zu übermitteln.

Wir haben die stets auf die Erfüllung eingegangener Verpflichtungen konzentrierte Arbeit von EDL und seinen motivierten Mitarbeitern im Rahmen dieser langjährigen Zusammenarbeit schätzen gelernt. Dadurch ist es uns gemeinsam gelungen, anspruchsvolle Projekte in fairer Zusammenarbeit und zum Nutzen beider Partner zu realisieren. Insbesondere möchten wir dabei auf die Epoxidharz-Anlagen LEUNA-Harze 1, 2, 3 und die Bisphenol F-Anlagen, sowie die Reaktivdünner-Produktion verweisen.

Wir sind gewiss, dass auch das gegenwärtig in der Realisierung befindliche Vorhaben LEUNA-Harze 4 in der gewohnt guten Qualität und termingerecht ausgeführt wird.

Die bisherigen guten Erfahrungen berücksichtigend hoffen wir, auch zukünftige Projekte unseres Unternehmens gemeinsam realisieren zu können.

Im Namen der Geschäftsleitung und Mitarbeiter der LEUNA-Harze GmbH verbleiben wir in diesem Sinne

mit freundlichen Grüßen

*Klaus Paur*

Klaus Paur  
Geschäftsführer  
LEUNA-Harze GmbH

Deutsche Bank AG  
KTO: 931 332 800  
BLZ: 660 700 00  
IBAN:  
DE86600700000001502800  
BIC: DEUTDEDB

Bau-Nr.:  
112/105/01300  
Ust-ID:  
DE 170 396 070

Registergericht  
Amtsgericht Stendal  
HRB 2097/13

Geschäftsführer  
Klaus Paur


„Our aim is to plan and build reliable, safe and ecologically friendly industrial plants. To this end we put our quality and safety policy into action.“

Dr. Holger Müller, Head of QS/SGU by EDL

Quality and quality assurance are the touchstones EDL likes to be measured by. Each employee takes up this challenge every day to secure the current and future success of the company.

We want our customers to look back to their projects with pride because all targets as to time schedule, budget and quality have been met uncompromisingly. Our customers' conviction that EDL can achieve exactly this, we see as the foundation of a successful and long-standing partnership.

That our customers are satisfied we hear often but hardly anyone voices its satisfaction so clearly as PCK Raffinerie GmbH and Leuna-Harze GmbH. We are delighted at this appreciation. We know, however, we cannot rest on the laurels but have to prove every day that we live up to the high quality standards.



Dr. Holger Müller,  
Head of QA/HSE by EDL



# PROJECT HIGHLIGHTS OF THE LAST 5 YEARS



Lifting of reactor dome for FCC reactor, TOTAL Raffinerie Mitteldeutschland GmbH, Germany



FCC gas concentration, PCK Raffinerie GmbH, Germany



The Pörner team at the OMV site in Schwechat, Austria



BP-TMC plant, HiBis GmbH, Germany

- 2011 PDA plant, H&R Ölwerke Schindler GmbH, Hamburg, Germany (new plant)
- 2011 Modification of FCC gas concentration plant, PCK Raffinerie GmbH, Schwedt, Germany (revamp)
- 2011 Emission reduction, Refinery Heide, Germany (revamp)
- 2012 Crude and vacuum distillation (AVT-6 plant), Russian refinery (revamp)
- 2012 Crude and vacuum distillation (AVT-8 plant), Ukrainian refinery (revamp)
- 2012 BP-TMC plant for Toyo Engineering Corp. (end user Hi-Bis GmbH at Bitterfeld, Germany (new plant))
- 2013 FCC plant flexibility, PCK Raffinerie GmbH, Schwedt, Germany (revamp)
- 2013 Replacement of vacuum column in vacuum plant, application of deep-cut technology, PCK Raffinerie GmbH, Schwedt, Germany (revamp)
- 2014 Crude oil distillation plant RD4, OMV Refining & Marketing GmbH, Vienna, Austria (revamp)
- 2014 Capacity increase of butadiene plant, OMV Refining & Marketing GmbH, Vienna, Austria (revamp)
- 2014 Conversion of FCC reactor, TOTAL Raffinerie Mitteldeutschland GmbH, Leuna, Germany (revamp)
- 2014 Alkylation plant, TOTAL Raffinerie Mitteldeutschland GmbH, Leuna, Germany (revamp)
- 2014 FCC gas processing plant, TOTAL Raffinerie Mitteldeutschland GmbH, Leuna, Germany (revamp)
- 2014 Medium-pressure desulphurization plant DK2, PCK Raffinerie GmbH Schwedt, Germany (revamp)
- 2015 Crude 1 and FCC plant, PCK Raffinerie GmbH, Schwedt, Germany (revamp)
- 2016 HDS3 plant, DEA2 plant and crude oil distillation plant RD4, OMV Refining & Marketing GmbH, Vienna, Austria (revamp)



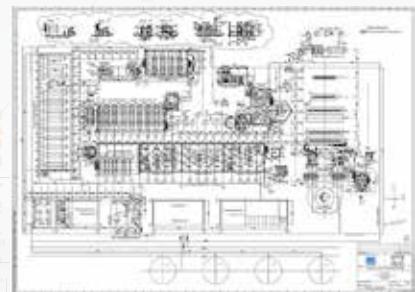
DK2 reactor, PCK Raffinerie GmbH, Germany



Refurbishment of the RD4 plant, OMV Refining & Marketing GmbH, Austria



Lifting of the vacuum column of the VT3 plant, PCK Raffinerie GmbH, Germany



Engineering of revamp for crude oil and vacuum distillation plant, Ukrainian refinery

# WHO WORKS HARD, ALSO PLAYS HARD!

In the 25 years of the company's existence we not only worked together and executed a lot of projects but also developed our own corporate culture marked by team spirit, readiness to innovate, perform and learn. Besides the daily work many company events have contributed

to the development of a sense of togetherness and identification with the company.

The following is a recall of passed special sports and cultural events with great experiences.



20<sup>th</sup> EDL company anniversary, September 2011, steamboat cruise on the river Elbe



Vintage car exhibition at „Da Capo“ in Leipzig, company get-together in September 2012



Company outing to Freyburg, visit of the champagne producer "Rotkäppchen" in September 2013



Summer staff party in June 2013



Christmas staff party in December 2014



Summer staff party in June 2014



Company outing to Dessau, visit of the "Meisterhäuser" and the Museum of Technology "Hugo Junkers" in September 2014



Company outing to the "Leipziger Neuseeland", visit of open-cast mining in September 2015



2014 - EDL Go-kart cup



2015 - Participation in the "Summerbash" volleyball tournament organized by Euro Engineering



2016 - Participation in "Commerzbank-Firmenlauf" in Leipzig



**EDL ANLAGENBAU GESELLSCHAFT MBH**

Lindenthaler Hauptstrasse 145  
04158 Leipzig  
Germany  
Tel.: + 49 341 4664-400  
Fax: + 49 341 4664-409  
E-mail: gf@edl.poerner.de  
www.edl.poerner.de

**PÖRNER INGENIEURGESELLSCHAFT MBH**

Hamburgerstrasse 9  
1050 Vienna  
Austria  
Tel.: +43 5 05899-0  
Fax.: +43 5 05899-99  
E-mail: vienna@poerner.at  
www.poerner.at