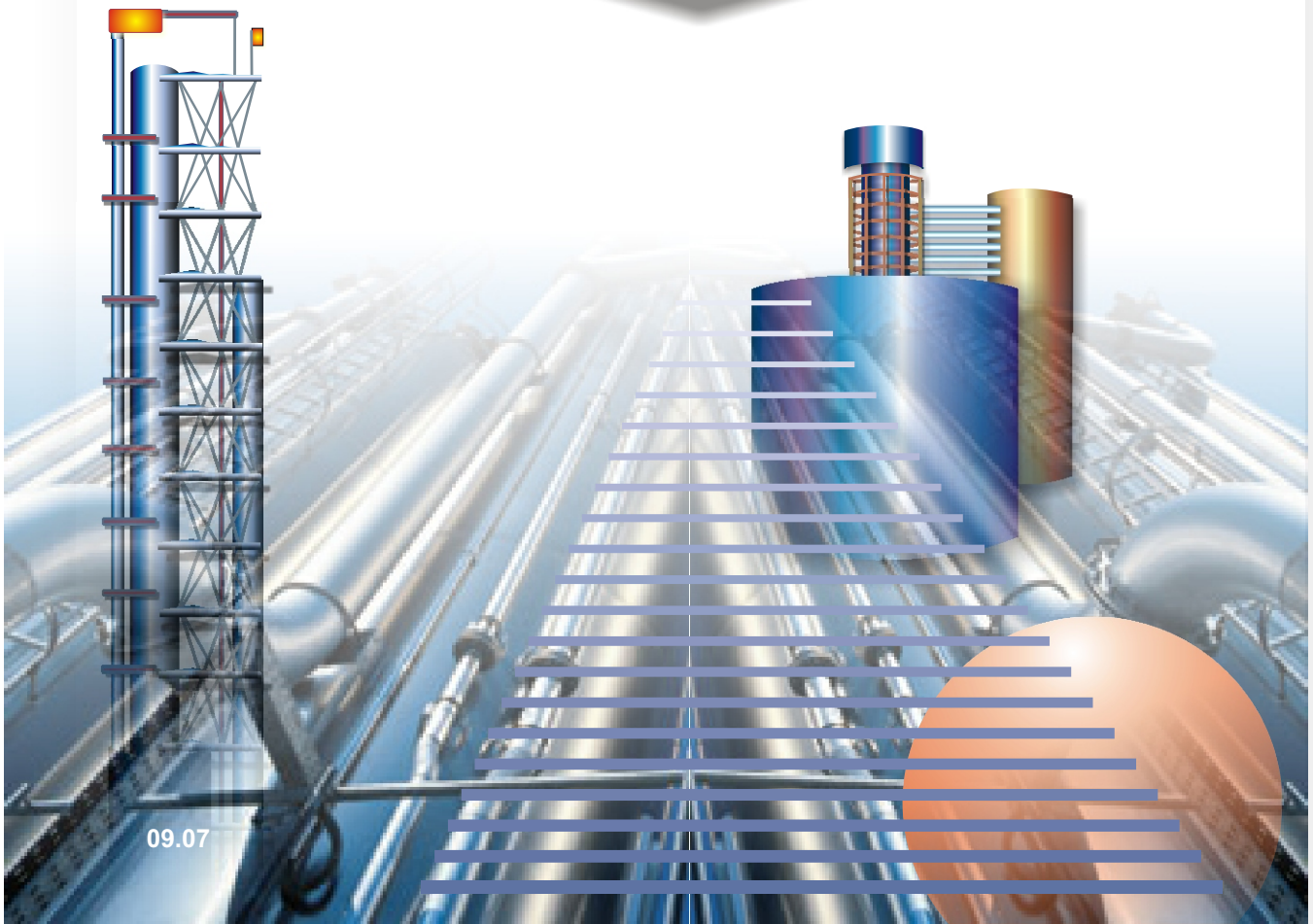


LK

engineering



english version

INGENIEURBÜRO H. KUNKEL GmbH + Co KG

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about us:

Since 1963 we operate as process and design engineers for industrial-plants in the field of

**CHEMISTRY
POWER GENERATION
ENVIRONMENTAL TECHNOLOGIES**

We are able to support our customers in carrying out projects or to deliver complete system solutions by our highly qualified employees from different fields of education.

We focus on

- **engineering**
- **project-management**
- **CAE - consulting and training**
- **plant modelling**

Long-term experience and competent integration of latest technologies ensure optimized solutions for our customers.

According to the requirements of the different projects the scope of work can be executed at the locations of our customers on site or in our own offices.

Our offices are fully equipped with work stations and the required software. Rooms for members of the customers project-teams and employees are available.

In case our customers need professional support for a project our engineers or technicians can be integrated into the team for the time needed. The assistance requested will be carried out in accordance with the instructions of our clients project-manager.

When the scope of our work is defined by a lump sum contract, our project-managers assure the prompt realization of the project according to the clients demand.

company information

head office:

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e-mail:	office@hkunkel.de
contact:	Dipl. Ing. Andreas Kämpfer

Quality management

Quality and value of our activities define our success. More than 30 years of professional experience and our specific knowledge of market requirements enable us to deliver what our customers are entitled to expect: Quality. An effective system of quality control in all fields of activities provides the platform for a continuously improved performance. Our employees combine their professional experience with the readiness to learn. We support their skills with regular training programs to ensure optimum qualification.



Communication and co-operation, both vertical and horizontal, are the key to successful teams in all departments. Openness for suggestions on improvements is an indispensable component for the motivation of our employees to be part of our quality system.

Our company's focus is on customer satisfaction. We are convinced, that a permanent dialogue with our clients must be integral part of our work to achieve optimum results. Long term success is what we strive for and what raises our motivation to continue in providing maximum quality.

ENGINEERING

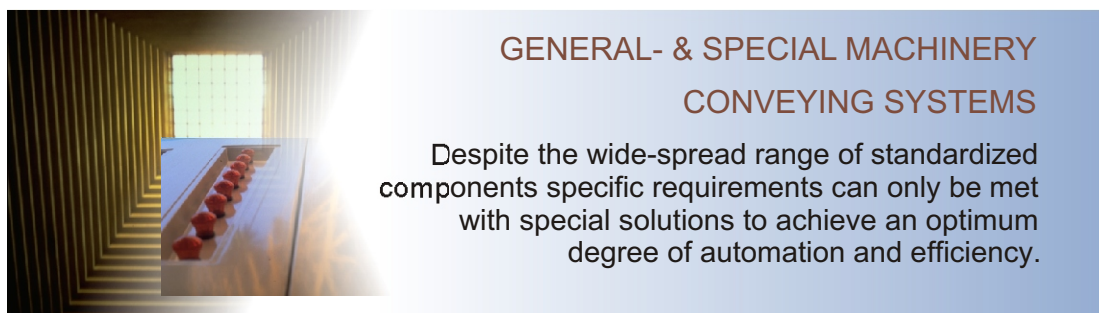
Plant Design requires a substantial share of all our engineering activities.
In particular we focus in the field of

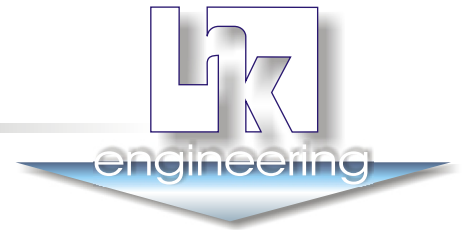


The main concept of our services is completed by special teams of highly
qualified engineers for handling projects in the fields of



Expert training and professional experience are requirements for the assignment
of our engineers to special projects in the fields of

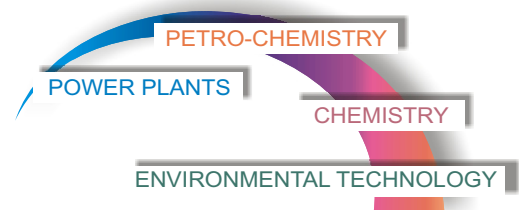




ENGINEERING

In the fields of

PIPING DESIGN,
INSTRUMENTATION- and
MECHANICAL EQUIPMENT DESIGN



we concentrate on delivering:

Project and Basic Engineering

Layout- and plot plans for authorization,
Preplanning, process engineering design

Detail Engineering

General arrangement plans
P & I diagrams
Design, calculation and specification of components
Piping Design and isometric drawings
Instrumentation and materials requisitioning
Quantity surveying and site surveys
Quality verifications, schedule-control and plant-documentation

Quality assurance and Scheduling

Quality assurance,
Scheduling control and documentation

Specification and Procurement

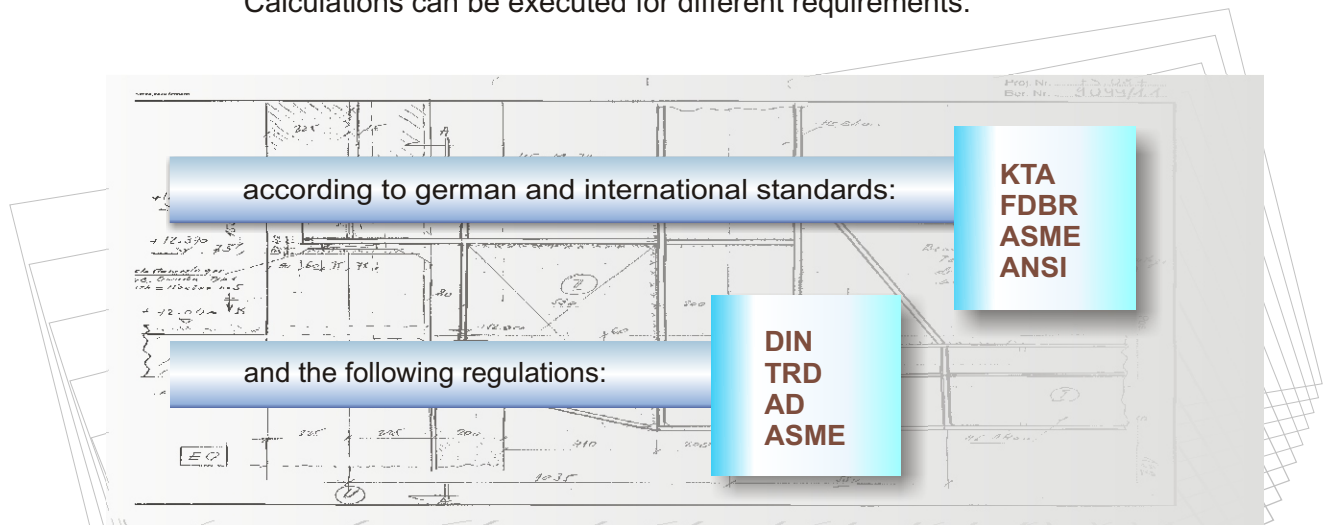
Technical inquiries and comparison of offers
Expediting

Construction Supervision and Start-up Operations

Supervision of plant construction
Start-up supervision of mechanical equipment and piping
Plant operation and test to hand-over of plants
Plant operating manuals and maintenance instructions
Training of customers personnel

ENGINEERING: Design Calculations

Calculations can be executed for different requirements.



We work with the following programs and methods:

VDI-Heat Atlas, Lauterbach	calculation of complete heat exchangers
AD 2000 Regelwerk, Lauterbach	calculations of instruments
WRC / WRCK, Lauterbach	stress-calculation
Piping networks RNET	hydraulic calculation of meshed piping networks
CAESAR II ROHR 2 KWU ROHR R2STOSS EASY-PIPE	stress-calculation for piping-systems
Finite Element Method	special calculations

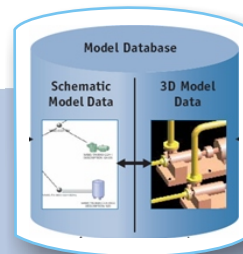
ENGINEERING: CAD-design and CAD-construction

Engineering services can be performed by the latest generation of CAD-methods. We are familiar in using existing design data (i.e. piping material classes) and/or generate new data sets as well.

The operation of the ODBC interface and attached tools under the operating systems MS-Windows make it possible to point out partial project data from the database, which can be used in further tasks.

Tools for project data:

ORACLE
MS-Access
MS-Excel



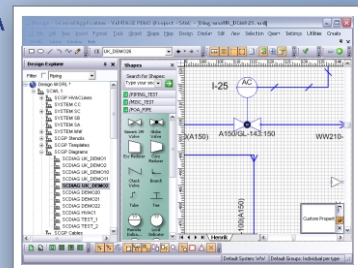
CAD basic tools:

Microstation
AutoCAD



Applications:

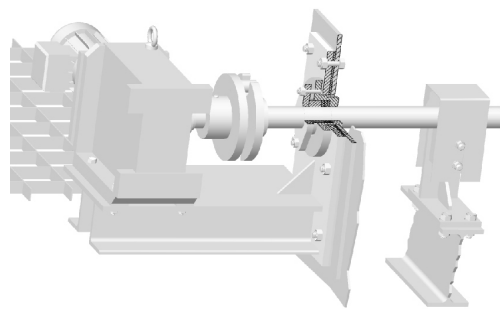
PDMS Plant Design Management System / AVEVA
PDS Plant Design System / Intergraph
Pro/ENGINEER
ISOGEN / Alias
PIPECAD / AVEVA
2D- und 3D-PIPE / CADISON
GENIUS
SPEEDIKON



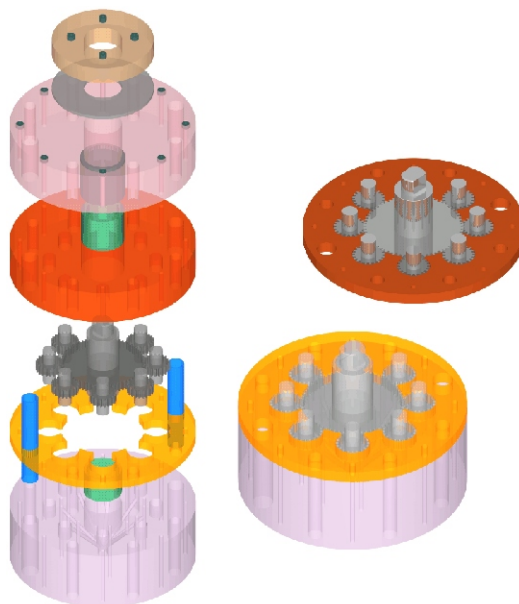
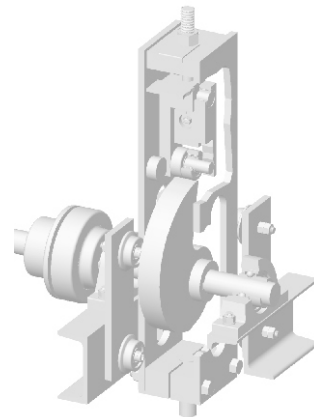
Our CAD-workstations are on the latest ergonomic and technical level.

ENGINEERING: CAD-Design

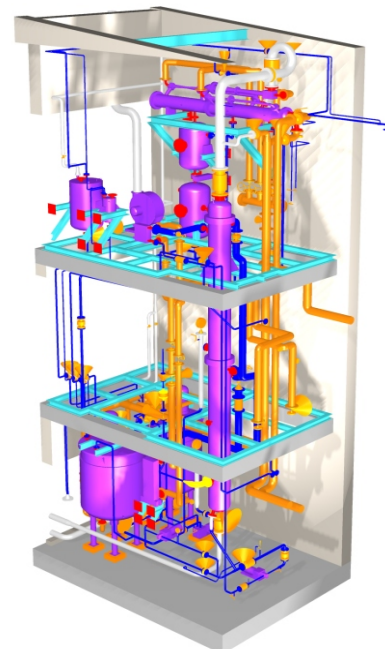
Examples from our projects:



3D-detail-view of an E-filter
for use in a service-manual



Partial view of an animation
"planetwheel 8"



Partial 3D-view of a plant
for product-stripping, designed with PDS

ENGINEERING: CAD-design and -construction

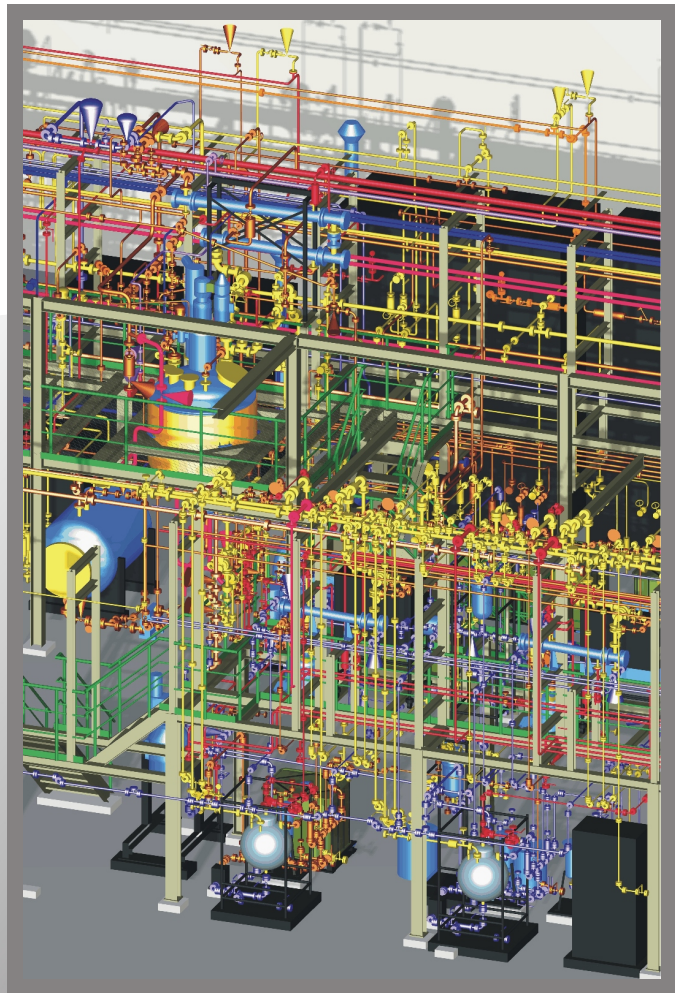
Project: reprocessing catalyst-mud-plant

Detail-engineering:

- component-arrangement
- pipework-design

scope of work:

700 pipes (DN15-150)
35 M&I
PDS (4 licences)
6 engineers
work period 12 months



ENGINEERING: CAD-design and -construction

Project: **concentration-plant**

Extended Basic Engineering:

- flow charts
- specification of components
- building design
(steel- and civil work)

scope of work:

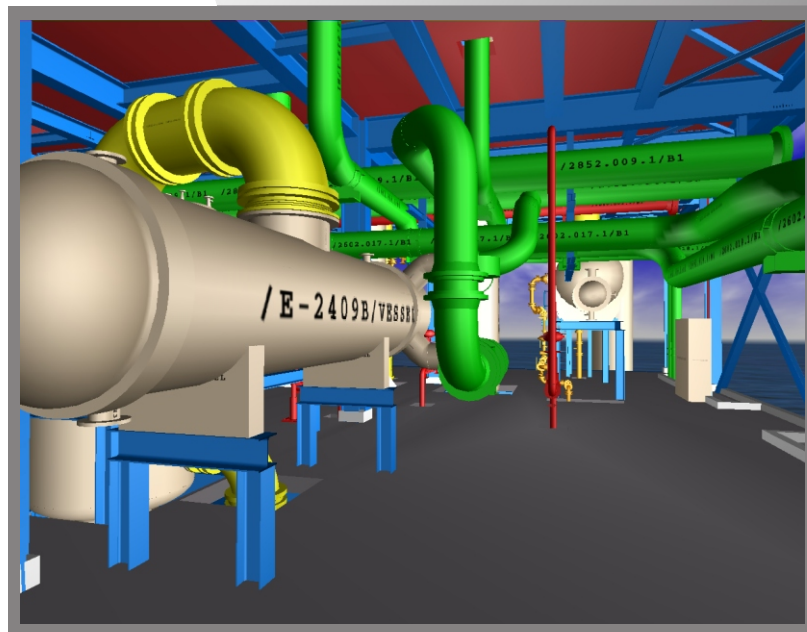
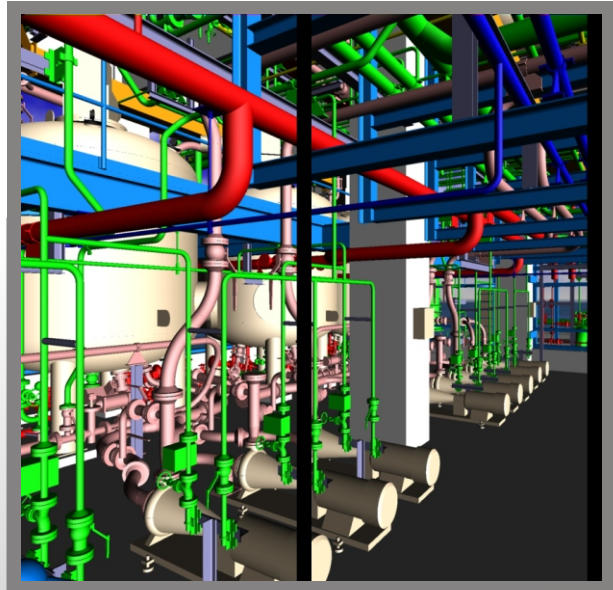
150 pipes (1" - 32")

108 M&I

PDS and PDMS (2 licences each)

6 engineers

work period 6 months



ENGINEERING: CAD-design and construction

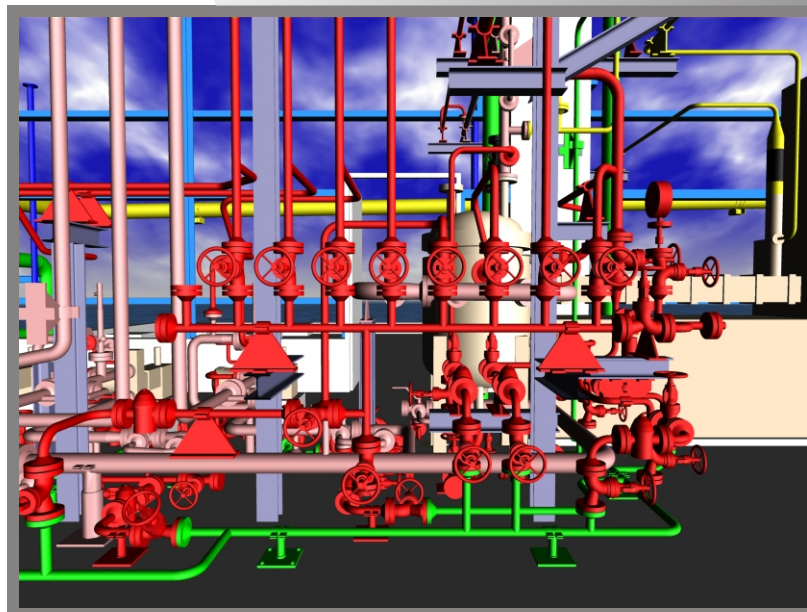
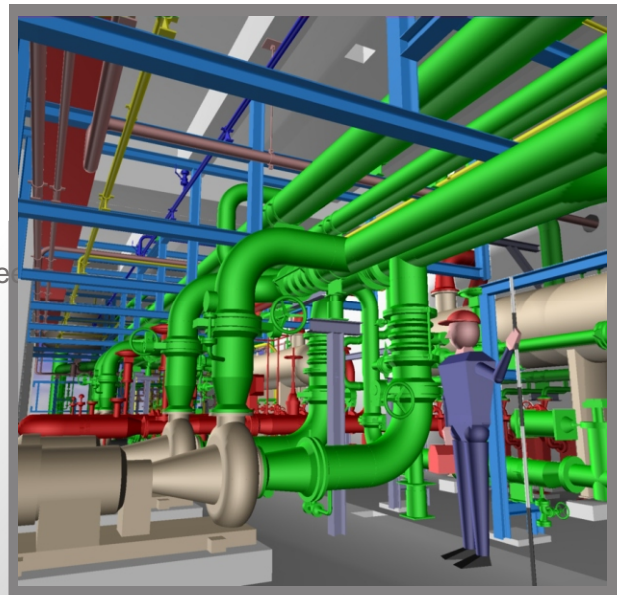
Project:
synthetics production-plant

Detail-Engineering

- component-arrangement (PDMS)
- pipework-design (PDMS)
- specification & procurement-engineering

scope of work:

2500 pipes (DN25-800)
221 M&I
PDMS (16 licences)
up to 20 engineers
work period 12 months

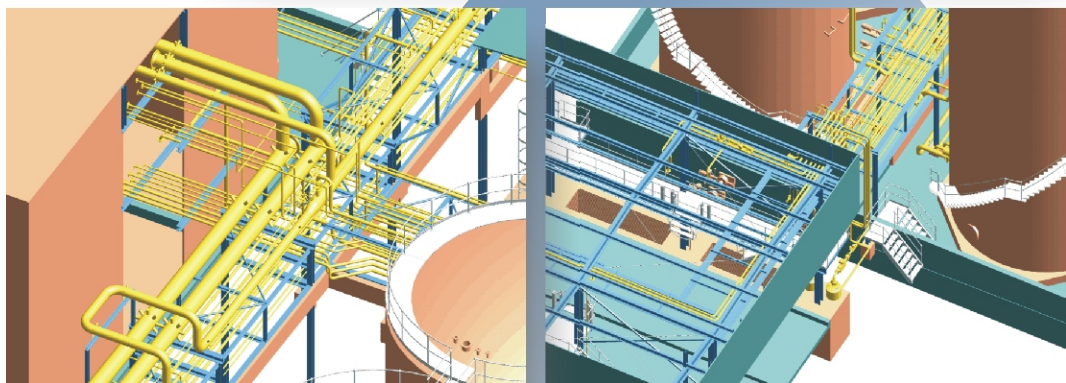
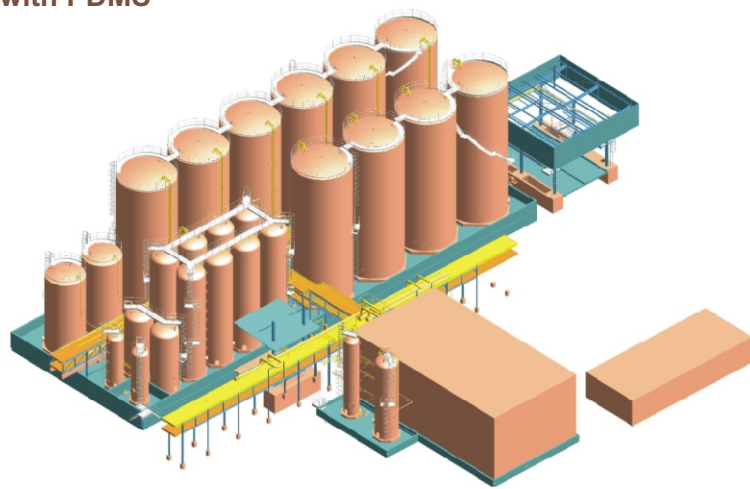


ENGINEERING: CAD-design and construction

Project: tank-farm

Piping Design with PDMS

200 pipes
28 tanks
18 pumps



ENGINEERING: CAD-design and construction

Projekt: 3D-PDMS-model of a plant for reactivation of acitvated carbon, with animation and visualization for presentations and fairs.



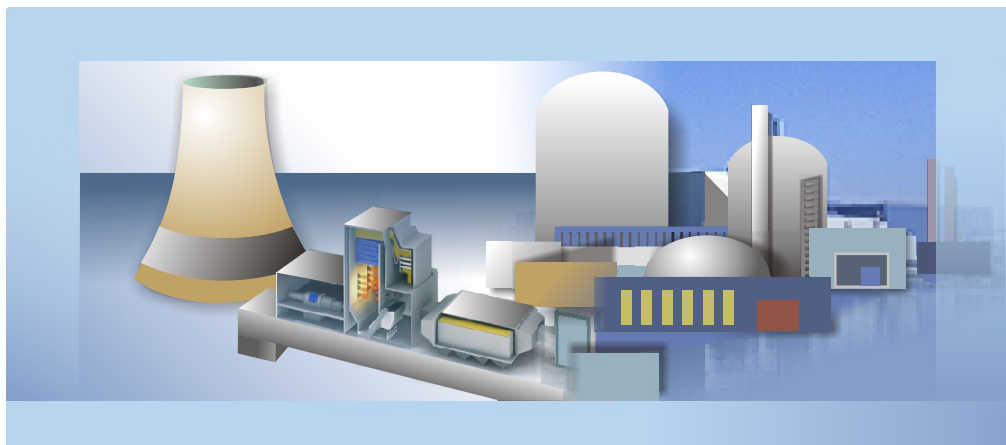
Jacobi
THE CARBON COMPANY



ENGINEERING: power generation

To ensure a long-term supply of energy, there is a considerable need to expand existing power plants and plan new ones. The estimated replacement and expansion requirements are approximately 400 to 500 GW.

As a result of the debate on climate change and the increasing scarcity of previous energy sources, new technologies are being developed in order to make power plants more efficient. In this respect, technological development for the expansion of renewable energies is also becoming increasingly important.



Our technical competence in power plant design is based on the extensive experience of our employees. For the power generation sector, a special department was set up back in the 1970s for the purpose of carrying out piping design and static/dynamic system calculations for nuclear power and fossil power plants.

Some of our employees who planned components for the first generation of nuclear power plants are now applying their valuable experience to expansion & revision projects.

we focus on:

- Project engineering
- Plant design
- Component processing
- Piping design
- Pipe system calculation
- Supervision of plant construction
- Start-up of systems

ENGINEERING: power generation

references:

**Conventional power plants
Nuclear power plants**

<i>client</i>	<i>location</i>	<i>activities</i>
ALSTOM Power Generation	Mannheim	turbine part design, sewage sludge combustion
ALSTOM Power	Nürnberg, Stuttgart, Butzbach	power plant design, flue gas dedusting
AREVA / FRAMATOME	Offenbach, Erlangen	power plant design & calculations
BABCOCK Borsig Power	Osterode, Oberhausen	power plant design boiler house, Denox
BBP Service Steinmüller	Gummersbach	power plant design
BEWAG	Berlin	power plant design, flue gas desulfurization
BHR Essener Hochdruck	Frankfurt	power plant design & revisions
DAVY Power	Frankfurt	KW Buschhaus plant model & design
HITACHI Power	Oberhausen	general arrangement plans for REA
KRAFTANLAGEN	Heidelberg, München	power plant design & revisions
KREMSMÜLLER / Siemens	Linz / Wien	detail engineering of piping systems for KW Timelkam
LAHMEYER International	Bad Vilbel	leading and power plant technology
LURGI	Frankfurt	power plant design: electro filter, flue gas purification, flue gas blower house & -channels
LURGI Lentjes	Düsseldorf	power-TWS-plant design, project engineering & plant start-up service
Mannesmann Seiffert	Berlin	power plant design
SIEMENS AG	Offenbach, Erlangen	power plant design, project engineering & processing

ENGINEERING: power generation

references:

Conventional power plants

We have performed different activities for the following power plants:

<i>conventional power plants: projects</i>	<i>location</i>
KW Reuter	Berlin
KW West	Berlin
KW Lichterfelde	Berlin
KW Moabit	Berlin
KW Ruhleben	Berlin
KW Niederrad	Frankfurt am Main
KW Mitte	Frankfurt am Main
KW Nordweststadt	Frankfurt am Main
KW Großkraftwerk	Mannheim
KW Römerbrücke	Saarbrücken
KW Timelkam	Österreich
KW Moerdijk	Holland
IHKW Industrie HKW	Andernach
KW Suez	Ägypten
KW Buschhaus	Helmstedt
KW Peterhead	Schottland

ENGINEERING: power generation

references:

Nuklear power plants

nuclear power plants: projects

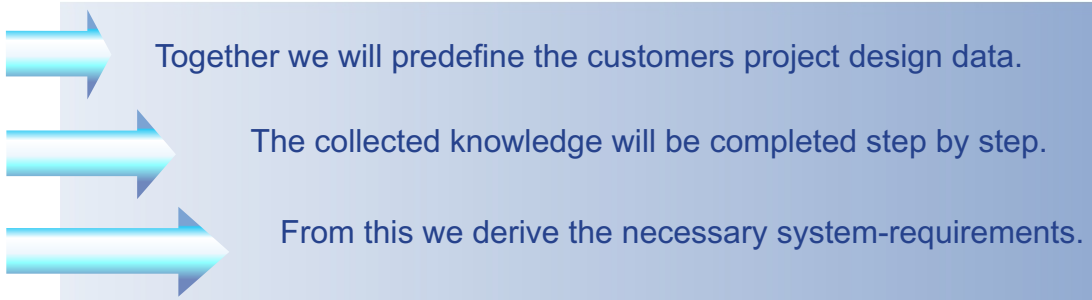
KKW Biblis	KKW Mülheim-Kärlich
KKW Brokdorf	KKW Neckarwestheim
KKW Brunsbüttel	KKW Obrigheim
KKW Emsland	KKW Philippsburg
KKW Grafenrheinfeld	KKW Würgassen
KKW Grohnde	WAA Wackersdorf
KKW Gundremmingen	THTR Schmähungen
KKW Isar	KKW Gösgen, Schweiz
KKW Kahl	KKW Ringhals, Schweden
KKW Krümmel	KKW Olkiluoto 3, Finnland
KKW Lingen	

CAE-consulting, training und adaptation

CAE-consulting

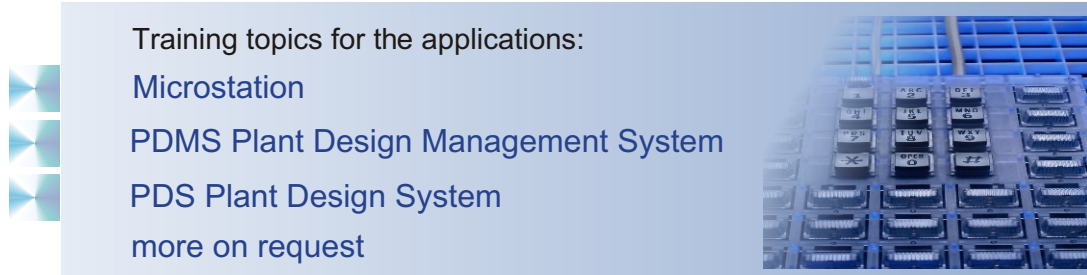
The growing requirements on systems in the CAD/CAE area make it more and more difficult for the user to find the best solution.

Our major goal in this area is to support our customer in finding the right decision by qualified consultancy. Here we use our experience on complex applications and systems (client/server configurations).



CAD-training

In our CAD-Training centre engineers and technicians are constantly being further educated and instructed. On special request we realise CAD-training courses in the familiar environment at the customers company. The special prerequisites for the training will be individually elaborated.



CAD-adaptations

In case of special requirements we are able to make our own applications for standard-CAD/CAE-Systems.



PLANT MODELLING

A qualified team of Plant Modelling Technicians is specialized in producing models for any requirement:

INDUSTRIAL MODELS FOR PLANNING

The production of Industrial Plant Models can be an important element of modern planning methods since 3-dimensional projection saves time and costs. Also design errors and misinterpretations are avoided, which would only become apparent in the construction phase.

LAYOUT-MODELS

We produce Layout Models for preliminary planning using simplified components, so that buildings and structures can be modified easily in their grid systems. Thus different plot proposals for Industrial Plants, Community Buildings, etc. can be demonstrated quickly.

ARCHITECTURAL MODELS

For city and landscape planning tasks Models for Buildings and Industrial Plants illustrate the total general impression of the project.



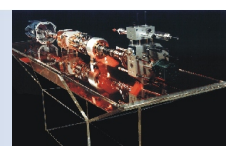
FUNKTIONAL MODELS FOR DEMONSTRATIONS

For fairs, exhibitions and sales promotions these models are used to describe process runs in an easy manner, thus to transmit a clear impression of complex coherences.



DESIGN MODELS

For newly developed devices and appliances the general optical appearance is often of utmost importance. Design models help to assess on a first impression gained.



Plant start-up Projects

Within this Services Division the Plant Projects as below were executed:

PROJECT	PLANT	SITE
MOSSGAS	Fattyacid-Fattyalcohol	S.AFRICA, Mossel Bay
ALPHA-OLEFIN	Fattyacid-Fattyalcohol	INDIA, Gordey
ARIBHAWANA	Fattyacid-Fattyalcohol	INDONESIA
QSL		CHINA, Bayin
POLYESTER	Fiber Plants	CHINA, Nanking
		CHINA, Xinhui
		CHINA, Tong Ling
SULINDA		INDONESIA, Jakarta
TENGUIZ		UDSSR, Tenguz
SILQUIMICA	Zeolith-Water Glass Plant	SPAIN, Miranda
ESTARREJA		PORTUGAL
UGS		FRG, Harsefeld
HKW-FRANKF.- WEST	Flue Gas Desulphurization	FRG, Frankfurt
AKR	Activ Carbon-Reactivation	FRG, Frankfurt
KW-LICHTERFELDE	Denox / NH3-Storage	FRG, Berlin
KW-STADTWERKE	Denox / E-Filter	FRG, Münster
MVA-MÜLLVERBRENNG.	Flue Gas Plant Compon.	FRG, Wuppertal
GASAG-SPALT	H.Press.Nat.Gas Reformer	FRG, Berlin
KW-RUMMELSBURG	Reactivation Plant	FRG, Rummelsburg
KW-SIERSDORF	Reactivation Plant	FRG, Siersdorf
MHKW-COBURG	Flue Gas Purification	FRG, Coburg
KW-REUTER-WEST	Flue Gas Desulphurization	FRG, Berlin
KSV-DORTRECHT	Sewage Sludge Combust.	NL, Dordrecht
KSV-LEEDS-BECKTON	Sewage Sludge Combust.	ENGLAND, Leeds
KOHLEBLOCK-BINA	Cole Power Pl. 2x286MW	INDIA, Bina

References -1-

<i>client company</i>	<i>location</i>	<i>activities</i>
ALSTOM Power Generation	Mannheim	turbine part design, sewage sludge combustion
ALSTOM Power Turbinen	Nürnberg	power plant design
ALSTOM Power Systems	Stuttgart	stress calculations
AREVA / FRAMATOME	Offenbach, Erlangen	power plant design and calculations
BABCOCK Borsig Power (BHR)	Osterrode	power plant design boiler house, Denox
BAMAG	Butzbach	waste water- and sewage sludge plant design
BASF SE	Ludwigshafen	chemical plant design, project engineering
BASF Antwerpen N.V.	Antwerpen	chemical plant design, project engineering
BASF Nederland B.V.	Arnheim	chemical plant design, project engineering
BBP Service Steinmüller	Gummersbach	power plant design
BEWAG	Berlin	power plant desing, flue gas desulfurization
BHR Hochdruck Rohrleitungsbau	Frankfurt Dortmund	power plant design & revisions
BHR Hochdruck Rohrleitungsbau	Oberhausen	plant design
Blohm & Voss	Hamburg	project engineering and managing
CB&I Lummus (ABB)	Mainz-Wiesbaden	project engineering, plant design and machine processing
Chemgineering	Wiesbaden	pharma plant design
CILAG AG	Schweiz	site investigation & layout planning
CLARIANT Werk Cassella	Frankfurt	plant design and authorization
CLARIANT Werk	Gersthofen	chemical plant design, project engineering
Conoco Phillips Wilhelmshavener Raffinerie	Wilhelmshaven	general arrangement plans & piping on site
DÜRR Systems	Stuttgart	combustion plant design
EMS-Services	Schweiz	processing of pipe-classes for CAE-systems (PDMS)

References -2-

<i>client company</i>	<i>location</i>	<i>activities</i>
EVONIK Degussa Group	Hanau, Marl, Frankfurt, Hürth, Wesseling, Kalscheuren, Rheinfelden	chemical plant design
EVONIK Röhm	Darmstadt, Worms	chemical plant design
FICHTNER GmbH & Co KG	Stuttgart	process rehabilitation of gas terminals
GEA Energietechnik	Herne	pipng design
GÖHLER	Hösbach	tank storage design
HERAEUS	Hanau	device construction
HITACHI Power	Oberhausen	general arrangement plans
KRAFTANLAGEN	Heidelberg, München	power plant design
KSB Fluid	Frankenthal	fountain water plant design
LAHMEYER International	Bad Vilbel	leading and power plant technolog
LINDE AG	Höllriegelskreuth, Tacherting	pipng design and calculation, plant start-up
LINDE AG	Aschaffenburg	plant modelling and construction
LINDE KCA	Dresden	site planning, construction supervision
Lummus Novolen Technology	Mannheim	Basic Engineering
LURGI Aktivkohle-Donaukarbon	Frankfurt	project engineering and plant start-up service
LURGI AG	Frankfurt	gas-, petrochemical and biofuel-plant design
LURGI Lentjes	Düsseldorf	power-TWS-plant design, project engineering and plant start-up service
MAINOVA AG	Frankfurt	Piping design & stress calculation
MAN Ferrostaal	Geisenheim	engineering, MTO's and calculation
MAN Turbomaschinen	Oberhausen	detail engineering

References -3-

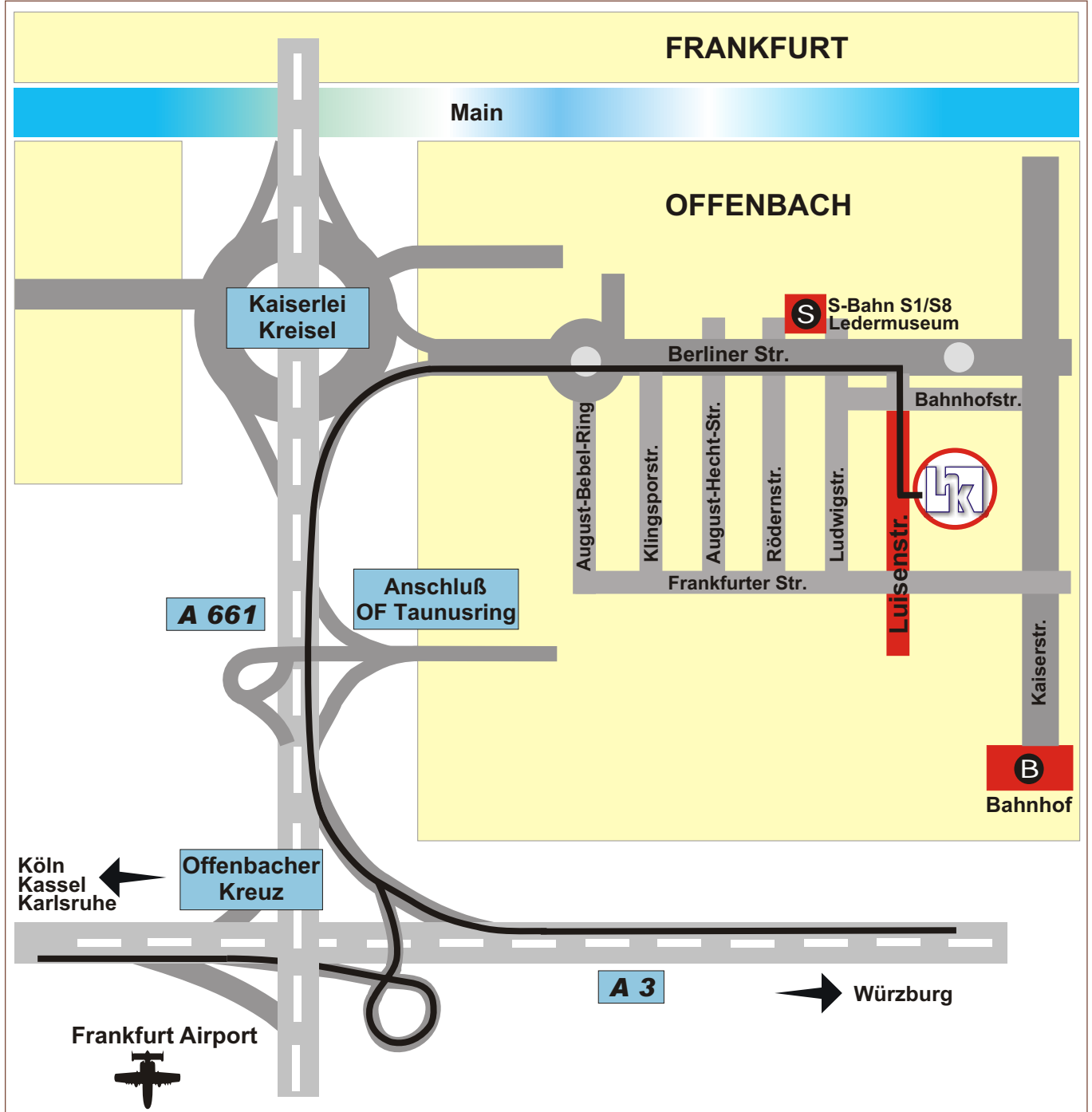
<i>client company</i>	<i>location</i>	<i>activities</i>
MANNESMANN Hüttenwerke	Duisburg	design & modelling dedusting plant
NIKKISO Pumps	Altenstadt	pump design
Adam Opel AG	Rüsselsheim	design of ventilation systems
Outotec	Oberursel	steel plant design
ÖMV Schwechat	Wien	planning of an oil-distillation & vacuum distillation plant
PALL Industrie Hydraulik	Dreieich	project engineering filter technology
PEROXID-Chemie	Pullach	chemical plant design
QVF-Engineering	Mainz	acid plant design
Raffinerie Burghausen	Burghausen	planning & start-up of systems
Raffinerie Harburg	Grasbrook	planning & start-up of systems
RHODIA ACETOW	Freiburg	general arrangements plans & piping design
SCHENCK Pegasus	Darmstadt	plant design conveying systems
SCHOTT Glas	Mainz	chemical plant design
SIEMENS AG	Offenbach, Erlangen	power plant design, project engineering & processing
SIEMENS Leitungsbau	Frankfurt	mobile radio-aerials & steel construction
Shell Deutschland	Wesseling	project support piping, Projekt processing
Steinmüller engineering	Südafrika	piping stress engineering
SÜDZUCKER AG	Mannheim, Ochsenfurth	basic-engineering and plant start-up
TECHNIP Germany	Düsseldorf	power plant design & revision
UHDE	Dortmund, Bad-Soden	plant design and piping design
UMICORE	Hanau, Rheinfelden	plant design and piping design
ZEPPELIN Silos & Systems	Friedrichshafen	stress-calculation for piping systems



engineering

**how to find us:
head office**

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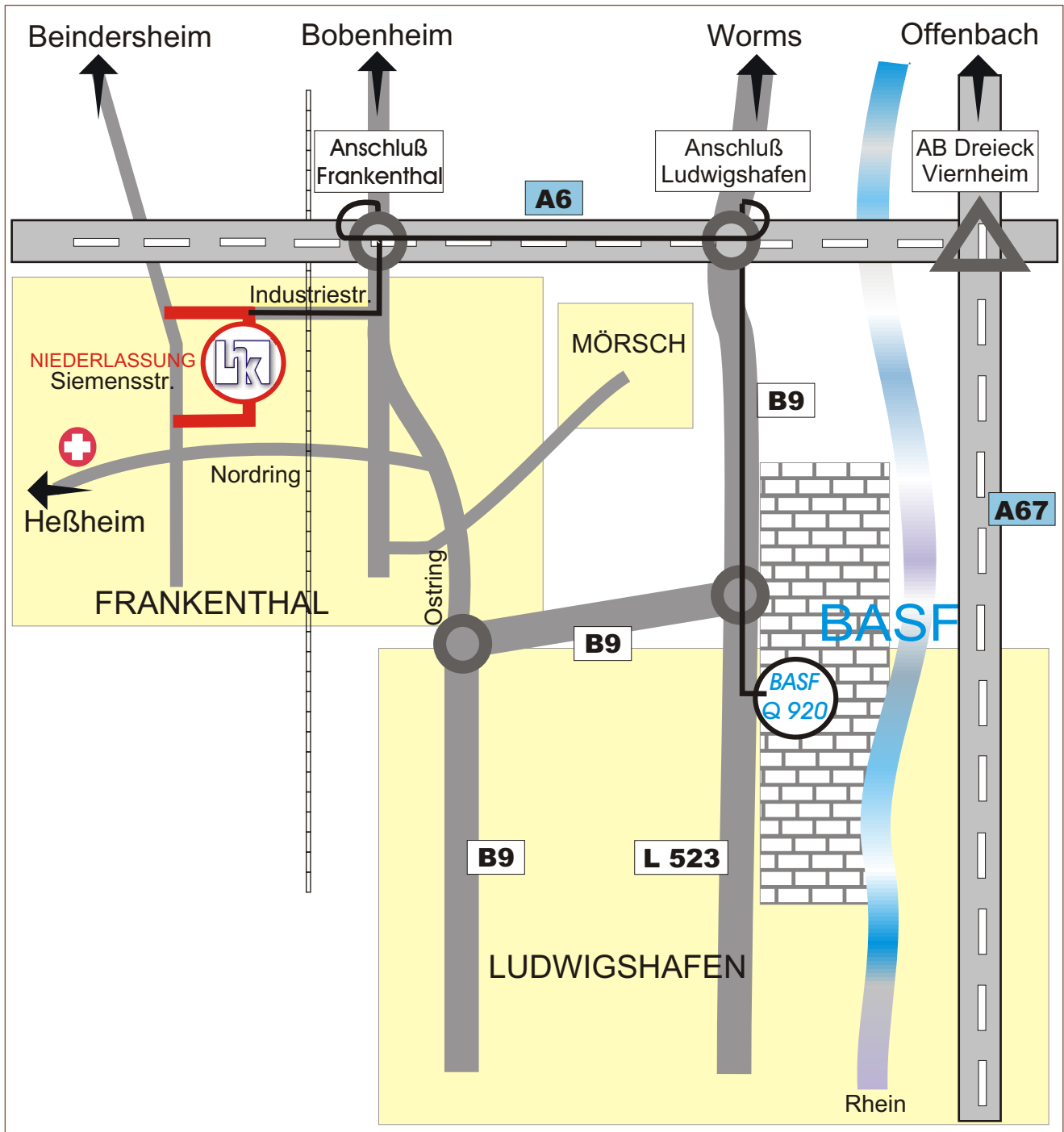




engineering

how to find our branch office

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