

K-UTEC
SALT TECHNOLOGIES

MANAGEMENT BOARD



DR. SEBASTIAN LÜNING

Executive Director

Phone +49 (0)3632 610-100
E-Mail sebastian.luening@k-utec.de

DR. HEINER MARX

Chairman of the Management Board

Phone +49 (0)3632 610-101
E-Mail heiner.marx@k-utec.de

DR. MARKUS PFÄNDER

Executive Director

Phone +49 (0)3632 610-200
E-Mail markus.pfaender@k-utec.de



MORE THAN 75 YEARS OF

AUTHORITY IN MATTERS OF SALT

... does not happen overnight. Since the 1950s the city Sondershausen in northern Thuringia has been a global focus point in the research, development and engineering for potash, industrial salts and minerals. As a part of the former GDR state-owned company Kombinat Kali with more than 32,000 employees, the „Kaliforschungsinstitut" (Potash Research Institute) was appointed with all development, research and planning work for the mines and processing plants within the Kombinat.

K-UTEC AG SALT TECHNOLOGIES has been continuing this tradition. The company was privatized in 1992 and is a joint stock company since 2008. Today it develops, advises, plans, tests and delivers key components for the salt and mineral extracting and processing industry in projects and tasks of any scale all over the world.

Our field of activities ranges from exploration and modelling of deposits to mine planning, design of process technologies, engineering and delivery of key components for complete processing plants and includes repurposing of mining, processing and industrial residues as backfill and special building materials. We are able to handle all types of inorganic salts professionally at all stages of the value chain, regardless of their origin, whether from natural deposits or industrial processes.

Our internationally recognized team of experts includes several so-called „Qualified Persons", a certified and accredited laboratory, extensive pilot plant facilities for the development and demonstration of complete treatment processes and moreover, many years of experience with numerous successful projects all over the world have put **K-UTEC AG SALT TECHNOLOGIES** in the distinguished position that it is in today.





DEPARTMENT OF

CHEMICAL AND PHYSICAL PROCESS ENGINEERING

Achieving the best for our customers ...

... is always our objective. To this end, we design plants in a way that enables us to produce all possible valuable products at the required quality, in highest possible quantities and at the lowest possible production cost. Of course, we keep the environmental impact in mind and minimise it as far as feasible and practicable.
The combination of an innovative team and extensive knowledge and experience collected over the course of many decades supporting the industry provide the ideal prerequisites for qualified process development, optimization of processes and engineering of complete processing plants for various inorganic salts, oxides, and hydroxides. Our professional team includes two „Qualified Persons“ in accordance with the internationally accepted standards (CRIRSCO, NI 43-101, JORC), who monitor, review, and release our feasibility studies and make them official documents accepted by banks stock exchanges globally.

Our in-house pilot plant facilities, which extend over an area of 1500 sqm, enables us furthermore to test and demonstrate complete manufacturing processes at a semi-industrial scale. Our customers and their financing partners can thus be assured that the planned processes not only work in theory, but also in practice.



OUR TEST FIELD

Our test field has a size of more than of 1,500 sqm and is equipped with process technology equipment and systems that can be flexibly combined to replicate complete production processes. In our pilot scale demonstration plant, we are able to process several tons of raw materials into the desired end products.

The demonstration of complete processes in a continuous operation provides the necessary investment security to our customers and their financing partners, supplies product patterns for early marketing of the planned products, and makes it possible to train and qualify our customers 'employees professionally before a plant is taken into operation. Unexpected complications during commissioning can be mostly avoided by this manner.

In addition to hardware in the form of equipment and systems, the technical centre also offers experienced operating and maintenance staff with comprehensive know-how and many years of experience. A modern laboratory can be used for accompanying chemical and physical evaluations.

PROCESS DEVELOPMENT & PLANT ENGINEERING

The plants developed, planned, and implemented by us are able to turn many raw materials into valuable products for the chemical, raw-material-processing, and fertilizer industries using state-of-the-art process technology.

Raw materials

- Mined minerals from underground deposits
- Seawater, brines and bittern from seawater evaporation and sea salt production
- Saline solutions of natural origin, lake brines and underground brines
- Solution mining brines
- Industrial waste water and sewage
- Tailings and residues from magnesium, aluminium and copper recovery



- Solid wastes and industrial residual materials with significant portions of inorganic materials, e.g. from recycling of batteries, hydroxide sludges and electrolyte recycling

Process steps

- Mechanical processing through grinding, crushing, screening.
- Flotation
- Membrane separation processes, osmosis and electrolysis
- Hot leaching processes with subsequent cooling crystallization
- Cooling crystallization and steam crystallization
- Fractional crystallization of simple and complex salts through solar and/or industrial evaporation processes
- Decomposition of double and triple salts
- Controlled precipitation of poorly soluble compounds, brine purification processes
- Brine purification by ion exchange resins
- Solid/liquid separation by sedimentation, filtration, centrifugation
- Drying and compaction of end products

Products

- Potassium chloride and potassium sulphate in fertilizer and industrial quality
- Sulphate-containing double salts (picromerite, leonite, langbeinite, kainite), Kali Magnesia
- Magnesium compounds such as magnesium carbonat, magnesium chlorid, Magnesium sulphate, magnesium hydroxid, Magnesium oxide
- Sodium chloride in food and industrial salt quality sodium sulphate as Glauber salt or anhydrous, sodiumcarbonate
- Calcium carbonate, calcium chloride, calcium sulphate as plaster, anhydrite or hemihydrate
- Aluminium hydroxide, aluminium oxide, alum, aluminate
- Boric acid, pentaborate, borax (e.g. from ulexite)
- Salts of energy metals, in particular lithium compounds, copper- and cobalt-, as well as nickel-containing salts, germanium, and salts of rare earths



RANGE OF SERVICES

Studies and Tendering Documents

- Project assessment and comparison of process variants
- Calculation of CAPEX and OPEX
- Evaluation of raw materials and production technologies
- Studies (Scoping, Prefeasibility and Bankable Feasibility Studies) according to internationally accepted standards, such as NI 43-101, CRIRSCO or JORC
- Draw up of tender documents

Process Design / Process Development

- Process analysis, optimization and development for handling of inorganic salts and minerals, definition of basic process parameters
- Preliminary mass and energy balances for complete processes
- Pilot-scale testing to support modelling of all basic process-engineering operations
- Development of flow diagrams in accordance with DIN EN ISO 10628
- Compilation of preliminary equipment lists
- Calculation of solar evaporation areas and pond design
- Estimation of CAPEX/OPEX

Basic Engineering

- Compilation of material, quantity, and energy balances
- Detailed process description of complete process plants
- Development of piping and instrumentation diagrams in accordance with DIN EN ISO 10628
- Dimensioning and specification of suitable process equipment and machines
- Compilation of equipment and consumer lists, also advanced estimation of CAPEX/OPEX
- 3D models and arrangement planning for complete plants/ plant sections
- Concepts for operation and maintenance of the plant
- Concepts for procurement, including possible suppliers, reference prices, and pre-selection
- Support in approval procedures
- Engineering for official permits





Contact

DIPL.-ING. / M.B.ENG.
CHRISTIAN ANDRAE
Head of department
Chemical and Physical Process Engineering

Phone +49 (0)3632 610-128
E-Mail christian.andrae@k-utec.de

Process-Relevant Detail Engineering

- Pipeline design and planning, including specifications (class of piping), 3D piping model, isometric drawings, installation planning as well as fitting and valve lists
- Master and manufacturing drawings for vessels and reactors
- Measuring points list, as well as list and specification of the measuring instruments
- Development of process and plant descriptions, specifications, regulation and control concepts
- Compilation of operating manuals and operating instructions
- Compilation of HAZOP studies

Delivery of Key Equipment

- Supply of special, patented loop reactors in various sizes
- Selection of suitable suppliers with industry-specific knowledge
- Preparation of tender documents with definition of limits of supply and services, general requirements for the bidder and conditions for participation in the tender
- Techno-economic bid evaluation incl. bid comparison
- Technical and commercial support of purchasing
- Expediting (monitoring quality, deadlines and logistics)

Commissioning, Performance Tests and Trainings

- Monitoring of process-relevant construction and installation work
- Check for mechanical completion for operation and successful start up
- Creation of operating instructions and operating manuals for different operating conditions
- Planning and monitoring of commissioning and performance tests
- Theoretical and practical instructions/trainings in the test field of **K-UTEC**, in running plants of our industry partners or during commissioning on site
- Practical training and instruction on the construction site during the commissioning of plants

Research and development projects

- Publicly funded R&D projects as SMEs
- Contract research for private clients
- Own developments


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DEPARTMENT OF

RAW MATERIALS AND INDUSTRIAL ANALYTICS

We want to know it exactly, in every detail ...

... as only accurate knowledge of the composition of raw materials will create a foundation that leads to sound decisions helping our customers to choose the right processes and technology to invest in. The laboratories of **K-UTEC** are specialized in salt chemistry, mineralogy and waste analytics. We analyse and assess solid and fluid samples from customers from all over the world, both physically, chemically and in a mineralogical context. Our services include the analysis of underground gas samples, as well as solving complex analytical problems and developing and evaluating measurement methods and procedures. The reliability of our analytical methodologies is confirmed regularly by the DIN EN ISO 17025 accreditation.



RANGE OF SERVICES

Salt analysis and mineralogy

- Chemical composition of all types of salts and minerals
- Analysis of salts of natural and industrial origin
- Products from the processing of salts
- Industrial crystalline waste (e.g. filter dust)
- „brine“ and concentrated salt solutions
- Accreditation for all methods for the determination of major components and to a large extent also for the methods for the determination of minor components

Environmental analysis organic & inorganic

Analysis of wastewater, ground and surface water

From sampling to evaluation according to legal requirements (Wastewater Ordinance), we support our clients in all questions concerning their industrial, commercial or domestic wastewater. Our laboratory is - here in the Kyffhäuser region - the only expert body according to the Thüringer Abwassereigenkontrollverordnung (ThürAbwEKVO).

Analysis of solid wastes

We offer our customers declaration analyses in accordance with the Landfill Ordinance (DepV) and LAGA of all types of mineral waste such as soil, building rubble and ashes.

Examination of gases

Thanks to our decades of experience with mine gases, we can also support our customers in assessing their fuel gases (natural and synthetic gas)





Contact

DR.
BASTIAN WIGGERSHAUS
Head of department
Raw Materials and Industrial Analytics

Phone +49 (0)3632 610-154
E-Mail bastian.wiggershaus@k-utec.de

EQUIPMENT AND METHODS

- Inductively coupled plasma - optical emission spectrometry (ICP-OES), Atomic absorption spectrometry (AAS),
- Ion chromatography
- Gas chromatography–mass spectrometry (GCMS)
- Elemental analyzer
- Flame photometer
- Spectrophotometer
- Total bonded nitrogen (TNb)
- Absorbable Organic Halides (AOX)
- X-ray diffractometer (XRD), X-ray fluorescence (XRF)
- Mineralogical analysis with XRD and XRF
- Analysis of main components using wet chemical process
- Polarizing, phase contrast and stereo microscopes
- Testing for heavy metals, sum parameters
- Sampling of solid, liquid and gaseous substances

CERTIFICATIONS, ACCREDITATIONS & QUALIFICATIONS

The department for Raw Materials and Industrial Analytics, like the entire company, is accredited to DIN EN ISO 9001:2015.

The salt, water and waste analyses of the Department of Raw Materials and Industrial Analytics are accredited according to DIN EN ISO/IEC 17025:2018 by the German Accreditation Body (DAkkS).

Officially recognized wastewater testing laboratory pursuant to Art. 8 Regulation of the Free State of Thuringia on Wastewater Self-monitoring (ThürAbwEKVO).

A dedicated team of chemists, analysts and mineralogists guarantees a high level of reliability with determining, evaluating and interpreting analytical data.





DEPARTMENT OF

MINING, GEOMECHANICS, BACKFILLING

WORKING GROUP

WASTE MANAGEMENT AND BACKFILLING TECHNOLOGY

When a green ield mining project cannot impact the environment ...

... either due to environmental permitting constraints or unfavourable public perception, our vision of a new sustainable mining paradigm will suit your needs. The Department Mining, Geomechanics, Backfilling especially the working group Waste Management and Backfilling Technology can support you in the design and engineering of combined extractive and backfill operations which allow maximizing the resource extraction ratio while minimizing or even eliminating the need for waste heaps and discharges. Using extractive and ore processing wastes as a valua-ble resource for an engineered backfilling material, it is possible to either decrease the pillar to room volume ratio, introduce a pillar extraction strategy or even apply longwall mining technology with continuous backfilling of the goaf.

When a mine's productive life is at an end ...

... it is usually a long time before the mine closure phase is completed. In addition to the rehabilitation and recultivation of used land and tailings heaps/ponds and the sealing of shafts and drifts, an important aspect of mine closure is securing the underground mine openings to minimize gradual and/or sudden subsidence risk. Using engineered mixtures of processing and/or industrial wastes it is possible to backfill the mine openings thereby limiting their convergence. The working group Waste Management and Backfilling Technology assists mine operators in formulating backfill mixtures, process development, materials testing, continuous improvement of backfill operations and quality control.

Special challenges call for individual solutions ...

... in particular for the mining of saline geological horizons. Standard construction materials based on cement or gypsum are not always suitable in saline environments on account of their lack of long-term (chemical) stability due to complex dissolution processes. Consequently, special construction and injection materials with a proven long-term stability are needed for the sealing of shafts, drifts, boreholes and headings.

The Department Mining, Geomechanics, Backfilling with the working group Waste Management and Backfilling Technology develops such special construction materials and sealing concepts for clients in the salt mining, industrial waste stowage and nuclear repository industries on a case-by-case basis.



RANGE OF SERVICES

Suitability assessment of industrial and processing wastes for backfill and landfill

- Material suitability assessments of industrial and processing wastes for underground backfilling
- Preparation of expert reports necessary for the permitting of underground waste disposal operations (UTD)

Consultancy and general services

- Support of clients through the development of waste management strategies
- Containment risk assessments and long-term safety proof for the stowage and disposal of (hazardous) wastes in salt rock
- Chemical/physical characterization of waste materials for stowage and disposal
- Preparation of safety data sheets and operating instructions for engineered backfill materials
- Classification of waste according to the Ordinance on Hazardous Substances
- Environmental Impact Assessments



Development of engineered sealing, construction and injection materials for (underground) mining

- Formulation of required chemical/physical properties for dry and hydraulic backfill materials
- Preparation of processing technology design parameters for backfilling operations
- Long-term proof of (chemical) stability of engineered materials
- Long-term proof of host rock suitability
- Assessment and evaluation of gas emission potential of backfill materials based on industrial wastes
- Development of engineered materials based on saline solutions and salt-based binder systems with a particular focus on magnesium oxide based systems
- Development of particle-free supersaturated saline solutions as injection media
- Dam construction materials with and without expansion capacity
- Development of special construction materials with expanse and self-healing properties for the application in mining and borehole (also oil and gas) sealing operations
- Development of construction materials with the ability to saturate in-flowing brines thus avoiding dissolution of sealing elements in underground openings



Process development and plant design

- Test work on laboratory and pilot plant scale for backfill production and placement processes
- Complete engineering of backfill production and placement processes from scoping up to Basic Engineering level
- Coordination of Detailed Engineering projects in close cooperation with reputable partners and equipment manufacturing companies
- Commissioning of backfill plants including the training of clients' personnel and the development of operating instructions and manuals
- Development of seal monitoring strategies and their practical implementation
- Estimation of CAPEX / OPEX

Backfill and construction material testing laboratory services

- Particle size distribution analyses using sieving techniques, laser particle sizer and photo-optical particle size analysis methods
- Determination of true, bulk and tapped density of solids, fluid density and Proctor density
- Compressive, direct shear and tensile strength testing of materials
- Measurement of elastic modulus of materials
- Compaction behaviour testing of materials (over both accelerated and extended time intervals)





Contact

DIPL.-CHEM.
DITTMAR LACK
Head of department
Mining, Geomechanics, Backfilling

Phone +49 (0)3632 610-141
E-Mail dittmar.lack@k-utec.de

- Oedometer testing, setting behaviour, swelling and shrinkage determination
- Determination of rheological properties of fluids and slurries (viscosity, flow characteristics and pumping behaviour under controlled temperature conditions)
- Determination of gas emissions from backfill mixtures based on industrial wastes (quality and quantity)
- Thermal analysis (DTG, DSC)
- Testing under climatic controlled conditions
- Abrasion measurements on granulates
- Granulation behaviour of solids with varying moisture content
- Strength testing on individual grains of solid materials
- Setting/water binding process characterisation (required time, heat generation)
- Pore fluid extraction and chemical characterisation
- Mixability and dissolution characterisation of solids
- Client-specific testing and experiments at laboratory- and pilot-scale

Research and development projects

- Publicly funded R&D projects as SME
- Contract research for private clients
- Own developments





DEPARTMENT OF

MINING, GEOMECHANICS, BACKFILLING

WORKING GROUP

GEOMECHANICS AND MINING

“Better safe than sorry”

This proverb has a very special relevance in the field of mining. The risks to miners arising from the surrounding rock mass as well as also the risks for investments in mine workings and equipment, are often significant and difficult to predict. The field of geo-mechanics creates a basis for determining the geomechanical status of mine workings. Complex stability analyses for the rock mass are prepared and continually updated, based on data derived from technical measurements (e.g. rock stresses, lateral strains on pillars, seismic monitoring, backfill quality tests, etc. and incorporating customer data (e.g. occurrences of surface subsidence, geological fissures, etc.. In addition, answers are also found to unique issues relating to rock mechanics in saline formations.

For mining companies - whether conventional mining or solution mining - planning is prepared, starting with scoping, feasibility and concept studies up to execution and detailed planning. In addition, professional and technical support is provided for the commissioning and regular operation of the plants.

For the construction and operation of brine fields, a comprehensive range of equip-ment, such as blanket control systems and safety equipment for the operation of the probe heads, can be supplied in addition to the mining plans. In most cases, the equip-ment is specially adapted to the existing I&C facilities, delivered and commissioned on customer request.



RANGE OF SERVICES

The Mining department has just about as many functions and applications as a Swiss army knife. There are many different tasks and projects extending to the four corners of the globe: deposit modelling, mine planning steps for underground extraction operations or for solution mining, maintenance concepts for abandoned mines, including securing of abandoned shafts, technical feasibility studies with varying degrees of detail, with CAPEX/OPEX cost calculations, production of customized measurement technology for solution mining, geological mapping, and much more.

Investigation and project evaluation

Exploration

- Planning of exploratory measures
- Geological and hydrogeological tests
- Exploration & Evaluation
- Estimation of resources and reserves
- Reporting according to international standards (e.g. NI 43-101, JORC)
- QP (Qualified Person)/QC (Quality Control)

Feasibility studies

- Geological modelling and reserve estimates
- CAPEX/OPEX cost estimates for underground and solution mining, and processing of rock salt
- Environmental impact assessments

Project evaluations

- Technical and economic assessments for greenfield and brownfield projects
- Risk assessments
- Profitability studies

Mine planning and Consulting

Mine planning

- Planning of underground and solution mining operations
- Extraction planning and dimensioning
- Planning of backfill measures
- Planning the recycling of mine waste and industrial waste (underground backfill)
- Planning of backfill and pillar extraction measures
- Planning of underground waste disposal



Consulting

- Geotechnical monitoring and support
- Geological investigation and analysis
- Geomechanical expert reports, verification of stability
- Backfill evaluation for underground backfills and underground landfills
- Concept and implementation planning for sealing structures in shafts and drifts
- Risk assessments for montane gases and influent solutions

Monitoring, safekeeping and renaturation

- Monitoring
- Planning, construction, installation and support of geotechnical and hydrological measuring systems
- Planning for post-operational phases
- Maintenance concepts, subsequent usage options, risk assessments and evaluations
- Planning and implementation of investigation measures in shafts (drilling investigation and on-site exploration) and in abandoned mines
- Stability estimates and risk assessments for abandoned mines, solution inflows and gas inlets
- Concept and implementation planning for shaft and mine maintenance, including construction support and supervision
- Planning of renaturation of mine locations and slag heap recultivation
- Rehabilitation of disused mines

Delivery of solution mining key equipment

- Design, specification and delivery of well heads
- Design, specification and delivery for blanket control systems
- Delivery of safety and monitoring equipment

Research and development projects

- Publicly Publicly funded R&D projects as SMEs
- Contract research for private clients
- Own developments


100AH



DEPARTMENT OF

GEOPHYSICS AND GEOLOGY

We‘ll get to the bottom of the movement ...

... the many small and medium-sized movements within a mine, which characterize the additional geomechanical dynamics of horizons used for mining. To record and localize these horizons, to determine their focal position and magnitude, and finally to draw the right conclusions and determine the possible hazard parameters, is the field of activity of the Monitoring group of the Department of Geophysics and Geology.

The development of hardware and software, design and plant construction, installation and operation of seismic monitoring systems on behalf of the customer, including daily evaluation, alarming and technical maintenance as well as vibration measurements are the tasks of the working group. Mining companies, cavern operators, geothermal power plants, old mining sites and industrial plants are the customers for stationary or temporary seismic monitoring systems.

Making visible what was previously invisible ...

... is the ambitious aim of our experts in the field of geophysical exploration. A wide range of geophysical measuring methods, the latest technology and decades of expertise, particularly in the fields of potash and salt mining – enable us to produce the data that the customer requires concerning deposits, subsoil, dikes, open pit dumps, etc., which then serve as a basis for decision making and strategy developments. We make visible what was previously invisible, whether it is above ground, in (saline) deposits, in the shallow sub-surface, conducting underground in boreholes, or calculating stratigraphic horizons using seismic, geoelectric or radar-assisted methods, we are the right specialist for the job.



RANGE OF SERVICES

A team of qualified geophysicists and experienced technicians guarantees the optimal execution of the projects from the development of the concept, the planning to the implementation.

Geophysical exploration

Methods

- Geoelectric sounding, mapping, 2D/3D tomography
- Surface and bore hole radar
- Seismic reflection and refraction, surface wave exploration, Hybridseismic
- Borehole seismic exploration, VSP measurements
- Seismic and electromagnetic tomography
- Sonar investigation
- Measurements of bore hole deviation
- Magnetic and VLF measurements

Application

- Cavity investigation
- Deposit exploration
- Hydrogeological and geohydraulic investigation
- Investigation of layer boundaries and geological structures
- Preliminary survey of the route
- Locating pipes and cables

Monitoring

Seismological monitoring

- Design, development and surveillance of seismic monitoring equipment and measures
- Operation of seismic monitoring systems
- Long-term monitoring of parameters



- Localization of seismic activity and qualification of seismic events (determination of the strength/ magnitude, epicentre, etc.)
- Interpretation based on the geological and local characteristics
- Issue of alerts in accordance with specific customer guidelines
- Combination of seismic monitoring equipment and shock measuring points according to DIN 4150
- Research and development (publicly funded individual and cooperation projects)
- Contract research

Other monitoring

- Planning, construction, installation and support of hydrological measuring systems
- Fluid and solid mass level in manhole pipes
- Solution level and density measurements in flooded mines
- Inflow monitoring facilities



Vibration measurements

- Measurement of vibration immissions according to DIN 45669
- Measurement and assessment of vibrations according to DIN 4150-2 - Actions on people in buildings
- Measurement and assessment of vibrations according to DIN 4150-3 - Actions on structural installations
- Vibration measurements in the area of machines, plants and equipment sensitive to vibrations
- Short-term vibration measurements by our qualified personnel on site or permanent metrological monitoring by remote access to the measuring equipment according to the task
- Automatic alarm (optical-acoustic signalling device, traffic lights, e-mail/SMS notification) when defined limit values are exceeded
- Use of modern and robust measurement technology with appropriate sensor technology, which allows simultaneous measurements at several measurement locations up to the monitoring of larger areas
- Application in mining (civil engineering, open pit, quarry, oil and gas production), for monitoring gas storage facilities and geothermal drilling





Contact

EUROGEOL DIPL.-GEOPHYS.
THOMAS SCHICHT
Head of department
Geophysics and Geology

Phone +49 (0)3632 610-171
E-Mail thomas.schicht@k-utec.de

- Application in the context of monitoring construction work (demolition, compaction, pile driving or drilling work), for recording blast vibrations (mining, compaction or demolition blasting), vibrations caused by road and rail traffic as well as by commercial and industrial companies

Research and development projects

- Publicly funded R&D projects as SMEs
- Contract research for private clients
- Own developments

CERTIFICATIONS, ACCREDITATIONS & QUALIFICATIONS

- The department for Geophysics and Geology, like the entire company, is accredited to DIN EN ISO 9001:2015.
- Registered quality geophysics company according to the Professional Association of German Geoscientists (BDG).
- The Vibration Measurement Group of the Geophysics and Geology Department is a testing laboratory accredited by the German Accreditation Body (DAkkS) according to DIN EN ISO/IEC 17025.
- **K-UTEC AG SALT TECHNOLOGIES** is announced as a measuring point according to § 29b Bundes-Immissionsschutzgesetz (BImSchG) in the sense of § 26 BImSchG for the field of activity „determination of vibrations“.

SELECTED

CUSTOMERS AND PARTNERS



For decades established medium-sized and large companies as well as junior mining companies have trusted in the competence and performance of **K-UTEC** - in process engineering, analytical, mining or geophysical issues.

Here you will find a selection of our customers and cooperation partners whom we were able to support with our services, products and systems.

We would be pleased to show you further references of our work in a personal conversation.

National

Authorities and mining offices

BfS - Federal Office for Radiation Protection

BASE - Federal Office for the Safety of Nuclear Waste Management

(formerly BfE - Federal Office for Nuclear Waste Management)

Federal Disposal Company (Company Asse, Company Morsleben, Company Konrad)

Covestro AG

DEEP.KBB GmbH

DEUSA International GmbH

DMT GmbH & Co. KG

EBNER GmbH & Co. KG

ERCOSPLAN Ingenieurbüro Anlagentechnik GmbH

Etex Building Performance GmbH

GSES - Glückauf Sondershausen Entwicklungs- und Sicherungsgesellschaft mbH

GTS Grube Teutschenthal Sicherungs GmbH & Co. KG

HELM AG

Helmholtz Association of National Research Centres

IfG - Institut für Gebirgsmechanik GmbH

K+S Aktiengesellschaft

KIT - Karlsruher Institut für Technologie (Karlsruhe Institute of Technology)

Knauf Insulation GmbH

LMBV - Lausitzer und Mitteldeutsche Bergbauverwaltungsgesellschaft mbH

Maschinenfabrik Köppern GmbH

Rheinkalk GmbH - Lhoist Group

SWM - Stadtwerke München

SWS - Südwestdeutsche Salzwerke AG

UGS - Untergrundspeicher- und Geotechnologiesysteme GmbH

VARTA AG

VNG - Verbundnetz Gas AG

Wacker Chemie AG Salzbergwerk Stetten



International

Nobian B.V., Kingdom of the Netherlands
Archean Chemical Industries Pvt. Ltd., Republic of India
Bangchak Petroleum Public Company Ltd., Kingdom of Thailand
Belaruskali AG, Republic of Belarus
Botswana Ash (Pty) Ltd, Republic of Botswana Cementos Pacasmayo, Republic of Peru
Circum Potash Minerals, Federal Democratic Republic of Ethiopia
Compass Minerals, United States of America
Cristal, Kingdom of Saudi Arabia
Dow Chemicals, United States of America
EuroChem Mineral and Chemical Company, Russian Federation
Geoalcali, Kingdom of Spain
Glencore, Swiss Confederation
Hatch, Canada
Hochschild Group, Republic of Peru
ICL Fertilizers, State of Israel

Cleveland Potash Ltd., United Kingdom of Great Britain and Northern Ireland
Intrepid Potash, United States of America
Jacobs Engineering Group Inc., United Kingdom of Great Britain and Northern Ireland
Kalium Lakes, Commonwealth of Australia
Kazzinc LTD, Republic of Kazakhstan
Lithium Americas Corp, Canada
LLC K-Potash Service, Russian Federation
NEDMAG Industries, Kingdom of the Netherlands
North American Salt Company, United States of America
Pairie Mining Limited, United Kingdom of Great Britain and Northern Ireland
Premogovnik Velenje, Republic of Slowenia
Salinen Austria AG, Republic of Austria
Sinochem Corp., People´s Republic of China
Sirius Minerals plc (York Potash), United Kingdom of Great Britain and Northern Ireland
SQM S.A., Republic of Chile
TATA - Chemicals Ltd., Republic of India
Toyo-Thai Corporation PLC (TTCL), Kingdom of Thailand
Uralkali AG, Russian Federation
Yacimientos de Litio Bolivianos, Plurinational State of Bolivia



K-UTEC
SALT TECHNOLOGIES

K-UTEC AG SALT TECHNOLOGIES
Am Petersenschacht 7 / 99706 Sondershausen / Germany
Phone +49 (0)3632 610-0
Telefax +49 (0)3632 610-105
E-Mail info@k-utec.de

www.k-utec.de/en

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