

Evolving the well-established

vdz

**Service
Offer**

High-quality services from a single source

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**Consulting, testing and
evaluating – worldwide**

VDZ is an internationally renowned scientific institute that focuses on practical research and providing a comprehensive service offer in the field of cement and concrete. Firmly rooted in the cement industry, we have contributed to energy- and resource-efficient cement production for more than 140 years. We are particularly focused on the performance of cement and its high-quality application in mortar and concrete.

Our five departments cement chemistry, concrete technology, environment and plant engineering, environmental measuring technology and quality assurance / analytics cover all areas of cement production and application. The institute is accredited and certified according to ISO 9001, EN ISO/IEC 17025, EN ISO/IEC 17065 and EN ISO/IEC 17021. Our competence is based on the extensive internal research activities of our interdisciplinary team, which reflect the latest science and technology.

VDZ's customers include cement and building material producers as well as construction companies and building administrations throughout the world. The combination of cutting-edge research and expert service establishes synergies that are reflected in the high quality and practical relevance of our work.

Optimisation of process technology

Process optimisation

- Technical analysis of the entire production process (from the quarry through to dispatch)
- Bottleneck analysis
- Chemical and physical analysis of all materials
- Optimisation of clinker and cement quality
- Review of clinker and cement properties
- Process and product evaluation in line with the latest science and technology
- Optimisation of primary and secondary measures for emission reduction and the minimisation of CO₂ emissions
- Efficient use of alternative raw materials and fuels

Energy efficiency

- Technical analysis of the energy demand of whole cement plants
- Determination and analysis of energy requirements
- Comparison of energy consumption with VDZ database and BAT (benchmarking)
- Identification and quantification of savings potentials
- Evaluation of optimisation measures
- Reduction of electrical energy demand (e.g. grinding, raw meal preparation, clinker burning, auxiliaries, compressed air, etc.)

Technical assessment of plant equipment

- Inspections and surveys of all rotating equipment such as rotary kilns, ball mills, vessels, incinerators, dryers and coolers
- Evaluation of maintenance processes
- Individual maintenance services according to clients' needs

Application of cement and concrete

Consulting and inspection

- Approval testing to obtain European technical approvals (ETAs), German technical approvals (abZ) and KOMO attestations with product certificate according to CUR 48
- Testing of alkali-silica reaction (ASR) performance
- Analysis of damage / development of damage avoidance concepts
- Life cycle assessments (EN ISO 14040, EN 15804), environmental product declarations (EPDs), sustainability certification of buildings
- Inspection of the production and placement of concrete

Testing of concrete and concrete constituents

- Testing of cement, aggregates, admixtures, additions, fibres and pigments
- Tests on fresh or hardened concrete and mortar (e.g. consistency, bleeding, segregation, compressive strength, tensile splitting strength, modulus of elasticity)
- Durability research (e.g. resistance to freeze-thaw and freeze-thaw with de-icing salts, chloride migration coefficient, carbonation, ASR)
- Applying special testing methods (e.g. for investigating the shrinkage of concrete)
- Applying testing schemes according to national (e.g. DIN, DAfStb, CUR), European (EN) and international (e.g. ASTM, ISO) standards/regulations and own developments (e.g. prediction of durability results)

Customer-specific services

- Development of special concrete and mortar mix formulations on customer request depending on the intended application
- Development of self-supervision and third-party inspection concepts for special construction projects
- Consultation regarding the production and use of new cements, binders, additions and concrete

Chemistry and mineralogy

Consulting and inspection

- Clinker-efficient cements and resource optimised concrete
- Optimization of concrete with regard to the application (Performance-Testing)
- Approval testing to obtain European technical approvals (ETAs) or national technical approvals (e. g. German abZ, KOMO)
- Alkali-silica-reaction (ASR): Expert opinions for special applications (e. g. concrete roads and airfields)
- Inspection of the production and placement of concrete

Management of concrete structures and sustainability

- Service life calculation and service life design
- BIM-based damage mapping
- Assessment of damage mechanisms and BIM-based repair planning
- Life cycle assessment (LCA)
- Environmental Product Declarations (EPDs)
- Sustainability assessment

Testing of concrete and concrete constituents

- Testing of cement, aggregates, admixtures, additions, fibres and pigments
- Tests on fresh or hardened concrete and mortar (e.g. consistency, bleeding, segregation, compressive strength, tensile splitting strength, modulus of elasticity)
- Durability testing (e.g. carbonation, chloride migration coefficient, resistance to freeze-thaw and freeze-thaw with de-icing salts, ASR)
- Applying special testing methods (e.g. for investigating the pore structure, the shrinkage or the heat of hydration of mortar and concrete)
- Applying testing schemes according to national (e.g. DIN, DAfStb, CUR), European (EN) and international (e.g. ASTM, ISO) standards / regulations

Environmental and climate protection

Environmental reports

- Support with licencing procedures
- Emission prognoses, burn-out expertises, prediction of raw material-related emissions, Hg cycle calculation
- Immission prognoses including complex ambient dispersion modelling, calculation of the minimum stack height
- Environmental impact studies
- Recommendation of measures to improve the emission and ambient air situation, e.g. plant-related optimizations
- Effects of construction products on water and soil

Environmental measurements

- Officially recognised as a monitoring body according to German legislation and accreditation in accordance with DIN EN ISO 17025
- Planning and competent performance of emission measurements
- Inorganic and organic gases, dust, heavy metals, etc.
- Special competence in the field of mercury measurement technology, e.g. mercury speciation, long-term measurements, etc.
- Performance of functional tests and calibrations of continuously operating measuring systems according to DIN EN 14181
- Creation of installation certificates
- Support in the selection of suitable measuring systems
- Consultation on the standard-compliant installation of measuring points
- Regular testing of the electronic data acquisition unit

Climate protection

- Strategic advice on CO₂ reduction
- Analysis of options for CO₂ capture, transport, utilisation and storage
- Site-specific evaluation of CO₂ reduction technologies
- Mass and energy balance evaluation of CO₂ separation technologies by means of process simulation

**Expanding and
developing knowledge**

Training services

- Online seminars and workshops on the topics of
 - Cement production technology
 - Quality assurance
 - Concrete technology
 - Environmental protection
 - Cement chemistry
- Process Technology of Cement Production
- Process Operator Training
- Plant Maintenance and Refractories Course
- Simulator Training
- Customised Training Courses, Seminars and Workshops
- Training services in English, German and Russian

VDZ Online Courses (www.elearning-vdz.de/en)

- Delivery of broad basic knowledge from quarry to dispatch
- Flexible learning via the internet from any location
- High quality animations and videos
- Monitoring and certification of learning outcomes
- Easy to use and to administer
- Courses available in English, German and Russian

Information specialists

- Special library and bibliographic database
- Professional support for any kind of information request
- Constant monitoring and documentation services for scientific publications, national, EU or international standards, patents etc.

Monitoring and certification

Accreditation and certification

- Accredited according to EN ISO/IEC 17025, EN ISO/IEC 17065 and EN ISO/IEC 17021
- Tests in the areas of applied technology, material technology, chemistry and protection from ambient pollution (accredited since 2002)
- Certification of construction products (accr. since 2002)
- Certification of quality management systems (accr. since 1998), environmental management systems (accr. since 2003), energy management systems (accr. since 2010) and occupational health and safety management systems (accr. since 2012)

Notified certification body for construction products

- Certification of cement and other binders (e.g. cement, masonry cement, special cement with very low heat of hydration, alumina cement, shotcrete cement, building lime)
- Certification of inorganic and organic concrete additives, pigments and pozzolana
- Monitoring and certification of aggregates for concrete and mortar, light aggregates, recycled aggregates, artificial aggregates
- Certification of concrete, mortar, grout and admixtures
- Cooperation with European institutions when certifying according to regulations under private law (BENOR, Dancert, KOMO, NF)

VDZ Cert: Certification body for the certification and verification of various management systems

- Quality management systems according to EN ISO 9001
- Environmental management systems according to EN ISO 14001
- Energy management systems according to DIN EN ISO 50001
- Occupational health and safety protection management systems according to DIN ISO 45001
- Implementation of energy audits according to DIN EN 16247-1
- Verification of greenhouse gas emission reports
- Verification of "Carbon Footprint of Products"

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