Evolving the well-established

VDZ

1877
–
today

Even today, more than 140 years after our foundation, cement and concrete are still our passion, and we are proud that we have increasingly been able to develop over the years into what VDZ is today: we see ourselves as a partner to the entire construction value chain. As a competence centre, our aim is to further develop the production and application of cement and concrete and to support all those involved in this process.

Today, we are faced with the major challenge of decarbonising concrete construction. Ultimately, CO_2 emissions in cement production are of particular importance. We at VDZ have played a formative role in this area from an early stage. We have made a significant contribution to researching the properties of clinker-efficient cements and understanding their behaviour in concrete. Our early work on CO_2 capture, especially in collaboration with the European Cement Research Academy (ECRA), is now an important part of the CO_2 reduction strategy in the industry worldwide.

We are aware of the great responsibility of our work. That's why we constantly scrutinise our work anew – it's not for nothing that our motto is »Evolving the well-established«. We want to make a difference together and are open to new ideas.

As representatives of our member companies and customers, but also as representatives of science, politics or plant engineering, you perceive VDZ in the diversity of its tasks. We stand up for our industry and challenge it. We offer customised services and work together with our partners in a variety of ways.

In the end, it is the cement that forms the brace of our work. It doesn’t just ensure a solid structure in the concrete. In fact, in our work we realise in an impressive way that cement also connects people. We are proud and grateful that we are able to help shape this as well.

Martin Schneider, Chief Executive of VDZ

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The VDZ building in Düsseldorf –
View from the south-east

Concrete comes into its own – VDZ building, reception area and stairs
to the meeting rooms and laboratories

Milestones – the history of VDZ

1877

Foundation of the Association of German Cement Manufacturers (VDCF)
On 24 January 1877, 23 of the 40 cement manufacturers operating in Germany join forces to create uniform standard test procedures for high-quality cements.

1879

Publication of the first German cement standard
From this time onwards, Portland cement becomes the benchmark of quality.

1901

Central testing of cements in the Berlin cement laboratory
External monitoring is key to the quality assurance of cements. All cements are therefore subject to the requirements of the standard and are tested externally.

General Assembly of the Association of German Cement Manufacturers in Heidelberg 1908

1949

First general meeting of the new VDZ
The cement manufacturers organise their research and joint work in the »German Cement Works Association« (VDZ). In accordance with its statutes, VDZ is also responsible for monitoring the cements of its members in accordance with the DIN 1164 standard.

1956

A new start in a new building
On 1 June 1956, VDZ moves into its new building in Düsseldorf's Tannenstrasse. With its spacious facilities, it will be VDZ's home for more than 60 years.

VDZ building in the Tannenstraße (1956)

1977

Celebration of the 100th anniversary on 27 September
At the 2nd International VDZ Congress in Düsseldorf in 1977, VDZ presents itself as a globally recognised pioneer and reliable partner for innovative research and development in cement production.

1995

VDZ draws up the first voluntary commitment to climate protection
For the first time, cement manufacturers have committed themselves, together with other energy-intensive industries, to contribute to the reduction of climate-relevant CO_2 emissions. The voluntary commitment is updated in 2000. A corresponding monitoring system documents the reduction successes.

2002

New service areas
VDZ positions itself with a comprehensive service portfolio for the entire cement and concrete value chain.

Initiative for sustainability in the German cement industry
The Social Policy Working Group of the German Cement Industry (SPADZ), VDZ and the industrial trade unions Bauen-Agrar-Umwelt (Building-Agriculture-Environment, IG BAU) and Bergbau, Chemie, Energie (Mining, chemistry, energy, IG BCE) launch the sustainability initiative to develop key issues for the sustainable development of the industry.

2003

Member of the European Cement Research Academy (ECRA)
Together with 18 international cement manufacturers, VDZ establishes the research platform for investigating innovative and forward-looking issues in cement and concrete production.

2007

Expansion of certification
The testing, monitoring and certification of cements and cementitious binders (PÜZ Centre) as well as the certification of management systems and verification of greenhouse gas emission reports are combined in a separate, independent area.

2012

Bundling research and development
VDZ bundles its work on research and development as an independent business division.
At the same time, it takes over the joint tasks of the Federal Association of the German Cement Industry.

2013

VDZ acquires large shares in Normensand GmbH
VDZ quality monitoring and the production of standardised sand complement each other perfectly.

2015

InformationsZentrum Beton (Concrete Information Centre, IZB) becomes part of VDZ
The information service on concrete, which is provided by the German cement manufacturers together with the Federal Association of the German Ready-Mix Concrete Industry (BTB), is integrated into the work of VDZ.

2020

Move into the new VDZ building
The new building in Toulouser Allee meets the latest requirements for flexibility and optimised work processes.

The new VDZ building – completed in autumn 2020

VDZ studies for a climate-neutral and resource-saving concrete construction method
The VDZ's CO_2 roadmap (2020) shows ways to achieve climate-neutral production and use of cement and concrete. The VDZ resource study (2022) identifies potential savings in natural resources along the cement and concrete value chain. The VDZ study on CO_2 infrastructure (2024) clarifies the requirements of a CO_2 infrastructure as a prerequisite for carbon capture, utilisation and storage (CCUS) and thus for climate neutrality.

People and values

VDZ's strong management team

At VDZ, we are proud of the fact that we have always been able to develop and sometimes reinvent ourselves. We are and have always been fascinated by cement. And so we like to tell the story of cement as a binder, the material of the millennium, without which our modern society would be unimaginable. We like to tell the story of cement as a building material that also connects people and builds bridges throughout the world, even between different cultures. And we like to tell our own story and how we have often reorganised ourselves here at VDZ. The story of the three pillars of our work: representing the industry, our work as a research and competence centre and our activities as a service provider for cement and concrete.

At VDZ, we try to address and live by the values that characterise a mature society today. We are grateful to those who have worked for VDZ before us for what they have built. Without their achievements, we would have no foundation for what we do today. We have clear rules that provide us with guidelines and security. We are commercially successful and we tend to the big issues facing the world. We want to live these values credibly, they are part of the story we tell, they are part of our identity and at the same time an incentive when we look to the future.

Our modern building in Toulouser Allee in Düsseldorf is part of our long-term vision for the future. After more than 60 years, VDZ has thus left its domicile in Tannenstrasse, home and focal point for many generations of employees and representatives of VDZ member companies. The new building is therefore also an expression of the development that VDZ has undergone in the decades since it was founded. With the new, modern building, its expertise and its roots in the cement industry, VDZ is perfectly positioned for the challenges that lie ahead for the cement industry.

Ultimately, however, it is all down to the people who work for VDZ: a strong management team that works together in a spirit of trust and friendship, and the employees in Berlin, Düsseldorf and the regional offices of the Concrete Information Centre, who are competent and enjoy their work. With our strong sense of unity, we are VDZ and will continue to develop it in VDZ's tradition and accompany the cement industry on its way into the future.

VDZ in figures

Around
22,000
samples a year
are tested

Around
200
employees
from 23 nations
in Düsseldorf
and Berlin

Over **500**
binders from
57 plants
are certified

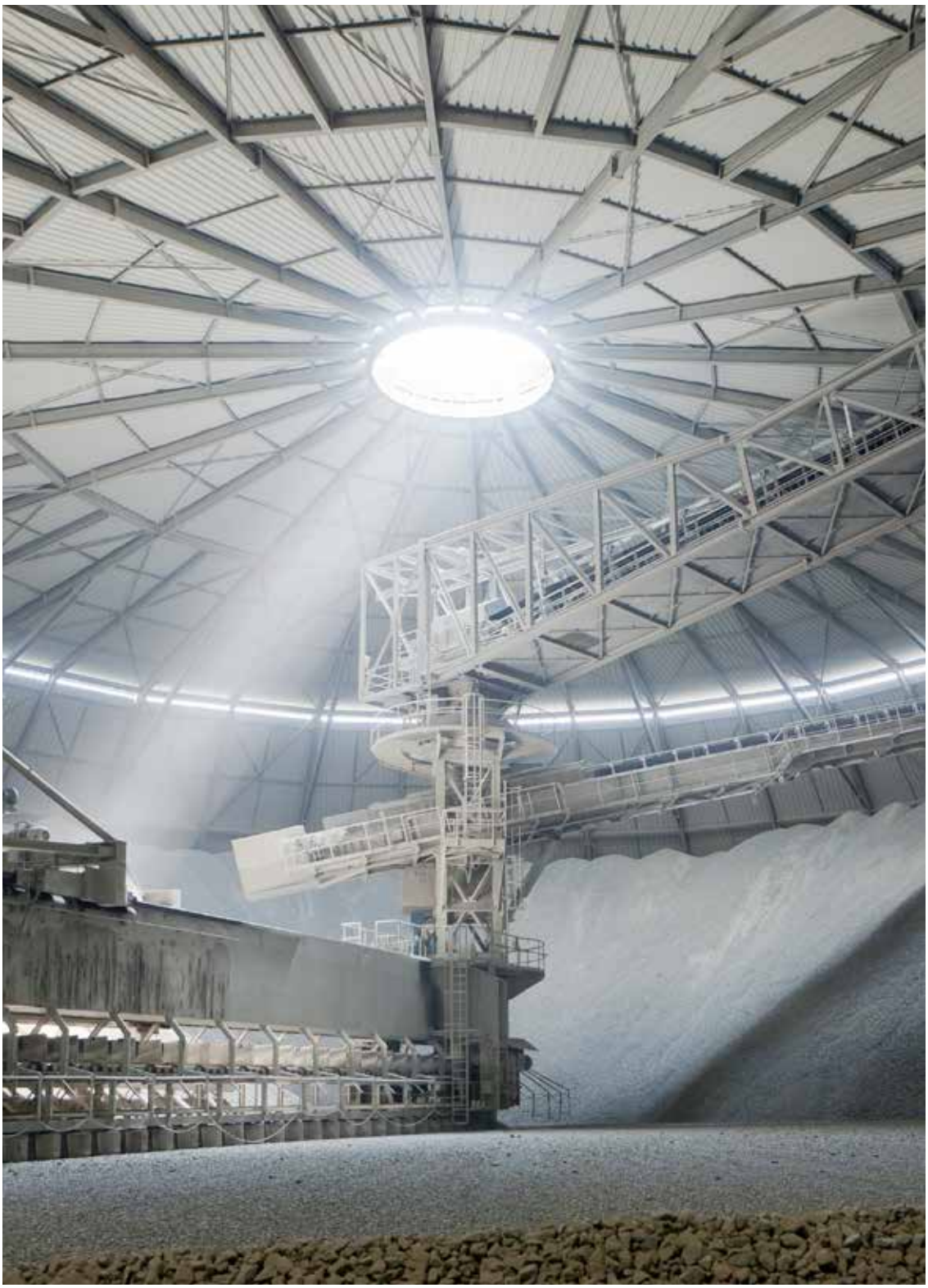
Approx. **800**
people a year actively use
VDZ online courses

Over **2,600**
specialised publications

19 ordinary and
extraordinary
member companies,
20 international
members

Around **41** ongoing
research projects
in the year

Cement production in Germany – what does VDZ do for the industry?



Cement plant in Germany – from raw material to building material

Cement production in Germany – what does VDZ do for the industry?

Around **8,000**

employees

52

cement plants,

31

of which produce clinker

VDZ was founded in 1877 as the Association of German Cement Manufacturers. As a joint organisation of German cement producers, it has been committed to environmentally friendly cement production and high-quality concrete construction for over 140 years.

VDZ is a pioneer and trailblazer in the industry

As a research and competence centre for cement and concrete, VDZ is recognised and valued worldwide for its practical research and comprehensive range of services along the entire value chain. It has an international network in industry and research. This enables VDZ to identify and address relevant future trends for the industry at an early stage. Important examples of this are the many years of research activities on CO_2 reduction in the cement industry and the focus on the challenges of digitalisation. VDZ is involved in national and international research projects and is a founding member of the European Cement Research Academy (ECRA). Its work focuses on developing innovative solutions for the sustainable evolution of the industry. The Stifterverband für die Deutsche Wissenschaft (Association for the Promotion of German Science) has acknowledged VDZ's research activities with the »Innovative through research« seal of approval.

VDZ is a driving force for the industry

Since its foundation in 1877, VDZ has been firmly rooted in the German cement and concrete industry. As part of its joint work, it works together with its member companies to address current research issues and future fields of action in the area of cement and concrete production. The valuable experience gained from this long-standing, pre-competitive joint work is now the knowledge pool from which VDZ can draw. Against the background of its high quality standards, VDZ has been actively involved in cement and concrete standardisation since its foundation. Today, it is involved in numerous national and international committees of other organisations. It also works in various areas with public authorities, universities and other organisations.

VDZ works closely together with national and international technical colleges, materials testing offices, trade and umbrella associations, standards committees and organisations from related industries – particularly with CEMBUREAU and the European Cement Research Academy (ECRA) at European level. Participants from the global cement industry value VDZ's national and international specialist events, which primarily address future-oriented topics and intensify the exchange of knowledge in this area. In addition, the Concrete Information Centre provided by German cement and concrete manufacturers offers a platform for all partners in the construction industry to promote sustainable products and processes for climate-friendly, resource-conserving and energy-efficient concrete construction.

Sustainable construction with cement and concrete

VDZ – also well represented in Berlin

VDZ studies show ways to achieve climate neutrality and greater resource efficiency

In view of global climate change, greenhouse gas emissions must be drastically reduced worldwide within a few decades. The cement and concrete industry is also taking responsibility and is prepared to make its contribution to a climate-neutral future. The industry has already taken extensive climate protection measures in recent decades and has reduced its CO_2 emissions by around a quarter since 1990. However, it is increasingly reaching its limits when it comes to further CO_2 reduction, as the process-related emissions from clinker production cannot be reduced with the technology available today. Therefore, completely new paths must be taken in the production of cement and its use in concrete on the way to climate neutrality. The VDZ study »Decarbonising cement and concrete – A CO_2 Roadmap for the German cement industry« published in November 2020 shows how this transformation can be achieved by 2045: using two decarbonisation paths, the study highlights the CO_2 savings that can be achieved along the cement and concrete value chain by 2045.

Due to the high proportion of unavoidable CO_2 emissions, there is no way around carbon capture when decarbonising not just the cement industry, but also lime production and waste incineration. A suitable infrastructure for CO_2 transport is also required for the subsequent storage or utilisation of CO_2. Against this background, VDZ presented a study on the »Requirements for a CO_2 infrastructure in Germany – Achieving climate neutrality in the cement, lime and waste incineration sectors« in March 2024, in which it presents the expected unavoidable CO_2 emissions of the three sectors. Based on this, it analyses how the demand for CO_2 transport will develop, how a CO_2 infrastructure should be designed and what requirements it must fulfil to achieve climate neutrality.

In addition to climate and species protection, the conservation of natural resources is one of the major ecological challenges of our time. Cement and concrete production, which accounts for around a fifth of the primary raw materials used in Germany, is also at the heart of this. The industry is aware of this enormous demand and is in favour of even more careful use of natural resources. Accordingly, VDZ's study »Resources of the future for cement and concrete – Potential and action strategies«, published in November 2022, shows what a 2050 scenario for further reducing the use of primary raw materials could look like.

As an association, VDZ is committed to the entire cement and concrete value chain

VDZ represents its members in matters of economic, climate and energy policy at state, federal and European level. At the same time, it supports cement manufacturers in facing up to new developments and in future-proofing themselves. VDZ provides its members with comprehensive industry-relevant information and news. It collects and analyses both market- and environment-related data and statistics. This includes domestic cement shipments, raw material and fuel consumption, electrical energy consumption as well as dust and NO_x emissions. As part of the sustainability initiative in the German cement industry, VDZ and its social partners are firmly committed to the sustainable development of the industry. Increasing energy efficiency and the responsible use of natural raw materials have always been in manufacturers' own interests. The German cement industry is therefore committed to the guiding principle of sustainable development.

VDZ ensures occupational health and safety

The VDZ »Occupational Safety« working group has been making an important contribution to occupational safety and health protection for many decades. Every year since 1965, VDZ has collected and analysed the numbers of reportable accidents in its member plants and summarised them in the VDZ accident statistics. It analyses the accident situation and develops measures to improve occupational safety. For example, VDZ regularly publishes new safety leaflets and safety checklists that increase occupational safety in the plants. In this way, VDZ not only ensures safe workplaces and work equipment, but also promotes general awareness of health and safety among employees and raises their awareness of potential hazards. According to VDZ accident statistics, the accident frequency rate has been reduced by 80% since 1969.

To recognise the consistent and successful safety work of cement plants in improving occupational safety, VDZ has awarded the VDZ Occupational Safety Prize every year since 1977. In addition, VDZ and the trade association for the raw materials and chemical industry (BG RCI) have signed the co-operation agreement »VISION ZERO. Zero accidents – healthy work!«. The aim is to further increase occupational safety in cement plants through additional prevention measures. Improved analyses of accident black spots, special support for small and medium-sized companies and even more personal consultations on site in the plants are intended to further reduce the risk of accidents at work and further increase the number of accident-free plants.

Occupational safety – a VDZ task
right from the start

VDZ training and further education – comprehensive and practical

VDZ takes care of training and further education

VDZ has been successfully offering training programmes for employees in the cement and non-metallic minerals industries for over 60 years. The offer ranges from technical foundation courses and the imparting of specialised knowledge to long-term further training courses for managers. Dialogue with the industry in the VDZ working group on personnel development and cooperation with the plants ensure efficient and practical learning with up-to-date content. VDZ organises numerous one-day and multi-day seminars as well as courses and workshops on the topics of clinker and cement production, process control, alternative fuels, environmental protection and concrete technology. The seminars, courses and workshops are offered in English, German and Russian as face-to-face seminars and as webinars in some cases. Almost all of these training events can also be designed and organised as in-house seminars according to individual customer requirements.

In addition, VDZ online courses have been available since 2010 as a cost-effective multimedia e-learning platform that can be used flexibly for individual training. VDZ employees work as lecturers at various universities in Germany.

VDZ thrives on evolving the well-established. This also means constantly scrutinising its own structures and developing them further. The VDZ building on Toulouser Allee in Düsseldorf also stands for this. Sustainably constructed, it provides a modern centre for the industry's research and collaborative work. This clearly demonstrates how VDZ is successfully adapting to the diverse challenges of the future.

Cement and concrete – building materials of modern society

We find cement and concrete in bridges, roads, schools, hospitals, sports halls, stadiums, offices and residential buildings. As the most important component of concrete, cement is indispensable for a modern society today and tomorrow. Without the use of this highly developed binder, the construction of sustainable and durable residential, office and industrial buildings as well as an efficient transport infrastructure would be inconceivable. In this respect, global demand for concrete and cement continues to rise, because many countries need to build or improve their infrastructure, above all to fulfil the requirements of increasing population figures. Cement raw materials such as limestone and clay are available worldwide. Concretes made with cement are extremely robust and durable in use. Therefore, there is no other building material today that could adequately replace cement and concrete.

The German cement industry plays an important role in the broad spectrum of the building materials industry and occupies a decisive position in the entire construction value chain. The industry's industrial network ranges from energy and raw material suppliers, mechanical and plant engineering, production-related services such as maintenance and transport to customer-facing areas, i.e. the manufacturers of ready-mixed concrete, concrete components and concrete products as well as the mortar industry, the building materials trade and the construction industry. The industrial cluster associated with the cement industry in the narrower sense, with its upstream and downstream sectors, provides at least 65,000 jobs in Germany. Irrespective of construction trends and increasing internationalisation, the cement industry has invested continuously in Germany. The investments not only serve to secure competitiveness, but also to continuously improve environmental protection.

Korbach Town Hall – model project for the Urban Mining concept

The Cube in Dresden – the world's first house made of carbon concrete

German cement manufacturers are fulfilling their social responsibility by investing heavily in environmental protection. And with success: as the German cement industry's regularly published environmental data shows, thanks to continuous investment in environmental technology, considerable progress has already been made in terms of energy efficiency and reducing plant emissions.

The ongoing optimisation of cement production has led to significant improvements in environmental protection. For example, the reduction of nitrogen oxides is important for cement manufacturers. To this end, they have utilised comprehensive reduction processes that reflect the current state of the art, safely comply with the limit values and ensure the protection of the environment and local residents. However, special attention is paid to the reduction of CO_2 emissions. For example, German cement manufacturers are consistently driving the development of clinker-efficient cements and thus noticeably reducing their carbon footprint compared to traditional Portland cements. The use of alternative fuels, some of which have a high biomass content (e.g. used tyres, sewage sludge), also reduces CO_2 emissions. Across the industry, only around a third of fuel energy is now covered by fossil fuels, meaning that more than two million tonnes less hard coal is used. Alternative fuels today cover around two thirds of thermal energy requirements. However, they are not only energy sources, but also go directly into the cement clinker as a raw material in the form of incinerator ash.

However, raw material-related process emissions that arise during cement production set limits to a further reduction in CO_2 emissions. For this reason, German cement manufacturers and their European partners from industry and science are also researching suitable techniques for carbon capture, utilisation and storage (CCUS). Carbon capture is being tested on an industrial scale as part of various demonstration projects. Despite making a significant contribution of its own, the cement industry is also dependent on external funding. One thing is clear: the higher cost of carbon capture must not jeopardise the competitiveness of domestic cement manufacturers and trigger undesirable carbon leakage effects.

When it comes to decarbonising not only the cement industry but also the lime industry and waste incineration, there is no way around CCUS due to the high proportion of unavoidable CO_2 emissions. In view of the expected transport requirements, the rapid development of a CO_2 pipeline network by 2035 at the latest is essential for the rapid development of carbon capture.

Research activities – What does VDZ research mean for the industry?

»For me, good work means using well-founded analysis results and key data to show the customer optimisation potential and help them find suitable solutions.«

Aneta Knöpfelmacher
Cement performance, microscopy

Research activities – What does VDZ research mean for the industry?

Around 30

multi-year research projects in progress

Approx. 10

new research projects are launched every year

Around 10

dissertations, master and bachelor theses are completed every year

Increased demands for resource efficiency and climate protection will continue to pose major challenges for the cement industry and thus for the entire modern concrete construction industry. As there is no silver bullet for overcoming these challenges in the short term, it is important to utilise the potential of all available options in equal measure. This is the main focus of VDZ's research activities.

Considerable efforts by cement plants to increase thermal energy efficiency have meant that this way of reducing CO_2 in cement production has now largely been exhausted. Alternative raw materials and fuels, in particular carbon-neutral biomass, have been used consistently for many years; nevertheless, there is still some potential for development here. Ultimately, however, the possibilities for further CO_2 reduction on the process side are largely exhausted or limited.

For this reason, the focus is now on so-called breakthrough technologies. Carbon capture in cement plants is a key element here. Under the umbrella of the European Cement Research Academy (ECRA), cement manufacturers, plant manufacturers, universities and scientific institutions have been investigating suitable technologies for several years that can be used to capture CO_2 in cement plants in order to store it for the long term (carbon capture and storage, CCS) or to use it for other purposes (carbon capture and utilisation, CCU). VDZ collaborated in developing the oxyfuel process for use in the cement industry under the auspices of the European Cement Research Academy (ECRA).

In addition, there is great potential for reducing CO_2 emissions and increasing resource efficiency in the various building material concepts, which are therefore a particular focus of VDZ's research work. Portland cement clinker will remain the main component of cement for the foreseeable future, as there are currently no alternatives in sight that are of sufficient technical quality to meet the constantly growing global demand for cement. Further increasing clinker efficiency by reducing the clinker/cement factor will therefore remain the main challenge in the future.

Against this backdrop, VDZ has been working on the production and application of clinker-efficient materials in its cement and concrete technology projects for many years. The challenge here is to further improve the carbon footprint and resource efficiency of concrete without losing sight of its technical performance. Depending on the concrete's field of application, durability is at the heart of these considerations. The spectrum ranges from environmentally friendly railway sleepers, networks to reduce primary raw material consumption and CO_2 emissions for concrete production to recycled building materials containing bricks as a raw material for resource-efficient cements. Other topics include the BIM (building information modelling)-based repair of reinforced concrete components and automated shotcrete application.

An important driver and source of ideas for numerous projects in the future will be digitalisation, e.g. in the form of building information modelling. Moreover, VDZ has been able to develop many innovations in recent years with several projects for further training and knowledge transfer, from which employees in the cement and concrete industry benefit directly and which improve the innovative capacity of the entire industry.

Climate protection, resource efficiency, the circular economy and the digitalisation of the value chain are thus already playing a key role in VDZ's research and will continue to do so in the future.

»VDZ has been a magnificent source of strength to me in my professional career [...]. I have thoroughly enjoyed working closely with you and all your colleagues [...]. The fact that so much has been achieved while at the same time lasting friendships have developed is truly magnificent and uplifting and what makes working in our industry so enjoyable.«

Director of a global cement manufacturer

Expertise on the scanning electron microscope – microstructures in focus

Modern cement production

- Carbon capture: oxyfuel and calcium looping process
- Efficient utilisation of CO_2
- Industrial slags as raw material components
- Drying and grinding of alternative fuels to increase energy efficiency
- Investigations of burnout conditions, sintering reactions and build-up formation with different fuel concepts
- Integrated power generation
- Utilisation of H_2 in the clinker burning process

Research for environmental protection

- Emission abatement
- Catalysts to reduce organic exhaust gas components
- Improvement of high efficient SNCR process in combination with staged combustion
- Emission reduction through model-based process optimisation

Networks for climate protection, resource efficiency and the circular economy

- Research partner in the scientific competence centre in the IN4climate.NRW initiative
- Network for the development & realisation of suitable, economical solutions for the production of recycled mineral building materials – RecyBau

Cements of the future

- Calcined clays – influence of the kiln atmosphere on emissions and product properties; XRD for production control of cements with calcined clays
- Performance – ternary clinker-efficient cements, e.g. with calcined clays and high limestone content; sulphate resistance and contribution to the prevention of alkali–silica reaction
- Circularity – suitability of new main cement constituents and sulphate carriers from secondary materials; IR spectroscopy for rapid identification of primary/secondary raw materials

Innovative concrete construction

Climate protection and sustainability
- Fresh concrete properties, hardening behaviour and durability of concretes with new clinker-efficient cements
- Optimisation of clinker-efficient cements using energy-efficient products from separate and joint grinding
- X-ray analysis for production control of cements with calcined clays

Circular economy
- Properties of fines from the recycling of mineral construction waste and their use in cement
- Recycling carbon concrete

Innovative durability analyses
- Durability of concrete according to the performance principle
- Influence of a damaging alkali-silica reaction on the frost and freeze-thaw resistance of concrete
- Influence of releasable alkalis from aggregates on a damaging alkali-silica reaction in concrete

Resource efficiency
- Concretes with clinker-efficient cements and recycled aggregates: investigations into thermomechanical Properties (spalling behaviour in case of fire)
- Performance of (two-layer) concrete paving blocks with clinker-efficient cements with special consideration of frost and de-icing salt resistance

VDZ gains important insights from the research results, which it makes available to all participants and from which the entire industry benefits. VDZ increases the competitiveness of the industry through joint research. Research funding comes primarily from the Federal Ministry of Economic Affairs and Climate Action (BMWK) through the Industrial Collective Research Programme (IGF). Other projects receive funding depending on their orientation and focus, e.g. through:

- the Federal Ministry of Education and Research (BMBF)
- the German Federal Environmental Foundation (DBU)
- the Dyckerhoff Foundation
- the European Union

Overview of research topics:
www.vdz-online.de/en/research-and-innovation

From clinker-efficient cement to resource-optimised buildings – the entire value chain plays an important role

International VDZ Congress –
a hub for knowledge sharing

»Everything was perfect, the venue, the presentations and the opportunity to meet people with whom we share a deep attachment to our industry. The VDZ Congress gave a very positive image of the European cement industry: dynamic, forward looking, innovative and committed to find solutions to the global warming question. Once again all my congratulations and all my thanks to you and the VDZ team.«

Participant from France

Services and consulting – what portfolio does VDZ offer the industry?

»For me, good work is when we develop a solution to a technical challenge for the customer that exceeds their expectations.«

Marco Duarte Lindemann Lino
Process Engineering

Services and consulting – what portfolio does VDZ offer the industry?

With an interdisciplinary team of experienced experts, VDZ offers a wide range of services, including process engineering, environmental and climate protection, cement performance, concrete technology and various laboratory services. The services range from comprehensive testing to complex expert reports and cover the entire value chain – from the quarry to the concrete structure. VDZ advises its customers individually, practically and independently on the basis of the latest research findings and its many years of experience.

Over 800

emission measurements a year

Around 40

technical reviews and expert reports a year

Around 180,000

chemical analyses a year

Around 4,000

tests on fresh and hardened concrete

Service and consulting – a comprehensive range from a single source

Process engineering

In the field of process engineering, VDZ offers solutions for increasing efficiency and reducing costs in cement production. With clear recommendations for action, VDZ shows how production processes can be optimised, plant performance improved and capacity increased – always with an eye on product quality. With its innovative solutions in the field of digital process support, VDZ can also reliably check the influence of measures to reduce emissions or the use of alternative raw materials and fuels on stable plant operation. The measurement of rotary kilns and ball mills as well as preventive maintenance measures can support ongoing operations and prevent unexpected production downtimes.

VDZ is also on hand to provide advice on the future challenges of decarbonising the cement production process – from conducting a CCUS feasibility study to support in the implementation of the selected carbon capture strategies.

Technical expertise to support customers – also practical in the control centre

VDZ offers the following services in the field of process engineering:

Thermal process engineering
- Technical analysis of the clinker burning process
- Optimisation of material conversion and clinker quality
- Optimisation of kiln operation and rotary kilns
- Advice on the use of alternative fuels and raw materials
- Reduction of sulphur cycles and build-up formation
- Burner optimisation using flame thermography
- Measurements in the high-temperature process
- Process engineering consulting for new plants

Mechanical process engineering
- Optimisation of grinding processes/grinding plants and separators
- Process engineering consulting for existing and new plants
- Characterisation of powdery substances
- Measurements in grinding and classifying processes
- Feasibility studies for separate ultrafine grinding

Technical reviews and benchmarking
- Kiln and mill reviews
- Energy audits

Climate-neutral process technology
- CCUS feasibility studies and decarbonisation strategies, including support for funding applications for carbon capture plants and process engineering design/optimisation of integrated carbon capture processes using simulation

Digital process support
- Digitalisation potential analysis
- Advice on the use of digital methods in production
- Process modelling

Maintenance
- Measurement of rotary equipment
- Inspection of mechanical systems
- Grinding of tyre stations and supporting rollers

»VDZ and its knowledge are important to us, and we want to capitalise on that.«

Plant manager from Austria

Microsections for microscopy – focussing on cement performance

Performance of cement

VDZ provides comprehensive advice worldwide on all aspects of optimising cement properties. The range of services extends from the assessment of the main constituents to the improvement of the formulation, the optimisation of workability and compressive strength through to product development.

VDZ supports its customers in improving the performance of clinker and cement with a wide range of services from chemical-mineralogical analyses to product optimisation. Based on precise analyses, solid conclusions can be drawn about the burning and cooling processes and individual optimisation measures can be defined. VDZ also offers advice on the use of alternative raw materials and the production of new types of cement. This holistic approach also includes the evaluation and improvement of the performance of cement in mortar and concrete.

In the field of chemical-mineralogical analysis and optimisation of cements, VDZ offers the following services, for example:

- Optimisation of cement properties
- Evaluation of cement constituents
- Advice on clinker-efficient blended cements
- Characterisation of new binders
- Improving the performance of cement in mortar and concrete

Environmental and climate protection

With its comprehensive environmental services, VDZ covers the entire value chain: from environmental assessments and emission measurements to the preparation of life cycle assessments for cement and concrete. Above all, VDZ is able to carry out demanding measurements in the high-temperature range and material balances across the entire process for its customers. With an experienced, interdisciplinary team of engineers and scientists, VDZ offers individual support in areas such as emission reductions and plant optimisation. In the life cycle assessment, the most important factors influencing the life cycle of cement or concrete as regards raw materials or energy consumption are identified for the customer so that they can subsequently be optimised. In this context, VDZ also develops CO_2 reduction strategies for companies. The portfolio of environmental services also includes the officially recognised, independent environmental measuring body, which is certified according to §29b BImSchG, 13th BImSchV, 17th BImSchV and TA Luft and accredited according to DIN EN ISO/IEC 17025.

VDZ offers the following services in the area of environmental and climate protection:

Environmental reports and licensing procedures
- Assessment of emissions and immissions
- Assessment of the impact on the product
- Preparation of environmental impact assessments
- Assistance with licensing procedures

Environmental counselling
- Advice on the use of alternative raw materials and fuels
- Advice on emission reduction processes and technologies
- Advice on the standard-compliant installation of emission measuring points
- Advice on the selection of suitable emission measuring devices

Environmental measurements
- Emission measurements of air pollutants
- Measurements for process optimisation
- Long-term emission measurements of mercury
- Measurements in the high-temperature process
- Functional testing and calibration of emission measuring devices

Environmental analysis
- Determination of raw material-related emissions
- Analysing aqueous solutions for organic and inorganic substances
- Release of trace elements from solids

Life cycle assessment

Strategic consultancy on CO_2 reduction

Environmental measurements – a wide range of services for all relevant emissions

Extensive material analyses – maximum precision and excellent teamwork

Concrete technology

Climate protection and resource efficiency also pose major challenges for concrete construction. At the same time, it is important not to lose sight of technical performance. In the concrete laboratory, VDZ therefore tests the performance of cement, mortar and concrete for its customers, for example in approval procedures for new, CO_2-optimised cements and concretes. All important tests are carried out on concrete raw materials as well as fresh and hardened concrete. Particular importance is attached to durability assessment, which, in addition to standardised tests, also uses state-of-the-art methods to predict the durability of materials used and also on existing concrete structures. In the field of structure diagnosis and structure management, VDZ takes on all the important steps for its customers, from the assessment of existing damage mechanisms to maintenance and repair planning – if necessary also using building information modelling (BIM). Great emphasis is placed on intensive consultation and support for the customer throughout the entire project.

VDZ offers the following services in the field of concrete technology:

Material testing
- Analyses of concrete raw materials (cement, aggregates, admixtures and additives)
- Testing of fresh and hardened concrete

Durability of concrete structures
- Durability tests
- Tests and expert reports on the alkali-silica reaction (ASR)
- Service life assessment

Structure management
- Damage assessment, damage analysis and damage prognosis
- Determination of maintenance requirements and BIM-supported maintenance planning
- Digitalisation of existing buildings

Approval tests and support during approval procedures for construction products
- National technical approvals and European technical assessment (ETA)

Sustainability assessment
- Life cycle assessment (LCA)
- Preparation of environmental product declarations

Customised services
- Recipe development and product optimisation
- Accompanying the installation of concrete and construction site audits

Modern laboratories and highly qualified employees – the basis for the highest level of quality

Laboratory services

VDZ offers a wide range of laboratory services. These include material testing, environmental analyses, including the determination of raw material-related emissions and the concentration of environmentally relevant components. In damage analysis, VDZ experts analyse damage to buildings, assess the current condition and plan protection and any necessary maintenance measures. VDZ also provides various reference materials for laboratory practice, which its customers can use to ensure the quality of their analyses. With corresponding laboratory reviews, it regularly checks analysis methods and identifies their potential for optimisation.

VDZ offers the following laboratory services:

Material tests and analyses
- Cement and its main constituents (including calcined clays)
- Mineral raw materials and kiln dust
- Concrete constituents
- Fresh and hardened concrete including durability
- Other building materials (e.g. lime and lime products, hydraulic road binders)
- Environmental analysis
- Determination of raw material-related emissions
- Analysis of aqueous solutions for organic and inorganic substances
- Release of trace elements from solids
- Primary and alternative fuels

Damage assessment

Reference materials
- Reference cements
- ASR test cement

Laboratory reviews
- Optimisation of test procedures in the laboratory

Training

VDZ has been successfully organising training courses for the non-metallic minerals industry and related sectors for over 60 years. The offer ranges from technical foundation courses and the imparting of specialised knowledge to long-term further training courses for managers. VDZ offers one-day seminars and multi-day courses on the topics of clinker and cement production technology, process control, firing alternative fuels, energy efficiency and clinker-efficient cements. Almost all of these seminars can also be customised and held as in-house seminars. With the online format, VDZ also offers a cost-effective multimedia alternative to face-to-face seminars. VDZ's training programme is available in English, German, Russian and some in French.

Scheduled training programmes
- Long-term courses
- Seminars, workshops
- Online seminars

Customised seminars / training courses

E-learning (in English, German, Russian and French)

»I thank you for taking the time to prepare and deliver an excellent training program. You and your team managed to be comprehensive, covering far-ranging subjects, risking meaningful, forward-looking discussions, and simplifying (without oversimplifying) technical concepts in a way that made sense from a business perspective [...]. We look forward to continuing to work together on many fronts.«

CEO of a global cement manufacturer

The VDZ training programme – a comprehensive range of seminars and e-learning courses

Certification – based on independent auditing and monitoring

»For me, good work means adhering precisely to standards and always guaranteeing quality, objectivity and independence in order to provide our customers with the best possible support.«

Jean-Marc Söldner
VDZ Cert

Certification – based on independent auditing and monitoring

More than 500

binders in monitoring

Over 200

procedures in the ongoing certification process

94

emission and allocation data reports are verified annually

Certification is a separate and independent service area that lies outside the VDZ service portfolio and therefore plays a special role. On the one hand, the certification services include the product certification of building materials. Here, testing, monitoring and certification of cement, binders, concrete, mortar, aggregates and concrete additives/admixtures ensure that the safety objectives of the European Construction Products Regulation and the local building regulations are met.

VDZ Cert is also an independent accredited certification and verification body. The range of services includes the certification of quality management systems in accordance with DIN EN ISO 9001, environmental management systems in accordance with DIN EN ISO 14001, energy management systems in accordance with DIN EN ISO 50001 and occupational health and safety management systems in accordance with DIN ISO 45001.

The certification body's range of services also includes certifications in accordance with the specifications of the Concrete Sustainability Council (CSC) and the performance of energy audits in accordance with DIN EN 16247-1. Furthermore, we offer small and medium-sized companies in the manufacturing industry the opportunity to obtain proof of an alternative system in accordance with Annexes 1 and 2 of the Peak Equalisation Efficiency System Ordinance (SpaEfV).

In addition to certification activities, the verification of greenhouse gas emission reports is another cornerstone of VDZ Cert's range of services. This is carried out in accordance with the relevant European and national laws and guidelines for submission to the respective supervisory authorities.

Companies from the stone, earth and building materials industry in particular are certified and verified. However, VDZ Cert's customers also include companies from the construction industry and other sectors.

Certification of different management systems – everything from a single source with VDZ Cert

We offer the following certification services:

Product certification of building materials
- Certification in accordance with the European Construction Products Regulation (CE mark)
- Certification in accordance with national building regulations (Ü mark)
- Monitoring in accordance with private law regulations (Benor, Dancert, KOMO, NF)

Certification of management systems
- Initial certifications (level 1 and level 2 audits)
- Recertification and surveillance audits
- Matrix certification
- Use of remote technologies for efficient audit execution
- Identification of potential for improvement to sustainably increase the company's success
- Examination of ecological compensation

CO_2 audits
- Verification of greenhouse gas emission reports
- Plant inspections
- Identification of improvement potential for CO_2 management
- Verification »Carbon Footprint of Products«
- Verification of greenhouse emissions at company and project level
- Verification »Capture, transport and storage of greenhouse gases«

CSC certification
- Review of the sustainability criteria in the CSC toolbox
- Carrying out on-site assessments
- Determination of the score achieved
- Issue of the certificate at bronze, silver, gold or platinum level
- Certification of CO_2 and R modules

»VDZ Cert offers you more than just a certificate. Together with you, we stand for expertise, transparency and sustainability.«

Silvan Baetzner
Head of Quality Assurance and Analytics

Kevin Mock
Head of the VDZ Cert Certification Centre

Quality control of cements – one of VDZ's main tasks since its foundation

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