150 years of building materials production

The History of Heidelberg Materials

The development of a company from southern Germany into an international Group

Heidelberg Materials

Der Heidelberger Portländer
Beiträge zur Unternehmensgeschichte und Unternehmenskultur (Heidelberg's Portland cement-makers: articles on the company's history and corporate culture), volume 15

This short history marking Heidelberg Materials' 150th anniversary is a revised and expanded version of volume 8 in the same series in which the corporate archives explored the company's origins. At the same time, an attempt is made to convey the historical situations and circumstances that led to the various developments – not only mergers and takeovers, but also closures. Within the given framework, however, it is not possible to present complete plant histories. As mentioned in the notes, there are already numerous accounts of the individual German locations. In order to provide readers with a complete overview, we will cover the company's history up to the present day.

The History of Heidelberg Materials

The development of a company from southern Germany into an international Group (edited by Heidelberg Materials AG)
Dietmar Cramer, Eszter Harsányi

Cover photograph: Mill building with shaft kilns
on the site of Bergheim mill, 1875.

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Heidelberg Materials

Heidelberg Materials – 150 Years of Progress

Preface

In 1873, Johann Philipp Schifferdecker started producing Portland cement – then a completely new building material – with just 35 employees in Heidelberg, Germany. He probably never imagined that 150 years later, Heidelberg Materials would be one of the world's largest manufacturers of building materials, with around 51,000 employees in more than 50 countries across the globe.

What is the foundation of our success? We owe it to our pursuit of progress and our focus on what we do best: building materials. This helped us to turn cement from an initially expensive material of varying quality to an affordable and high-performing product that has shaped our modern world.

Since 1873, our building materials have been instrumental in countless innovations around the globe. Innovations that we've come to take for granted but which were groundbreaking at the time: From skyscrapers to air- and seaports, from highways to subway systems, bridges, and iconic architecture – Heidelberg Materials' building materials were and are the foundation to all these milestones of progress.

Today, the world needs smart, sustainable, and resilient infrastructure, buildings, and public spaces – more than ever. Challenges like climate change and resources scarcity mean that the production and use of building materials must evolve.

At Heidelberg Materials, we are harnessing our forces worldwide to push forward. We are already leading our industry when it comes to the future of construction: We will offer decarbonised cement and concrete as early as 2024. Our most important lever is the optimisation and further development of our sustainable product portfolio. With process improvements and innovative technologies such as CO_2 capture, utilisation, and storage, as well as investments in the circular economy, we are continuously reducing our carbon footprint. And we're driving the digitalisation of our sector, unlocking new, smart features for our customers.

Based on 150 years of progress, innovation, and expertise, we are committed to building and shaping a more sustainable future for generations to come.

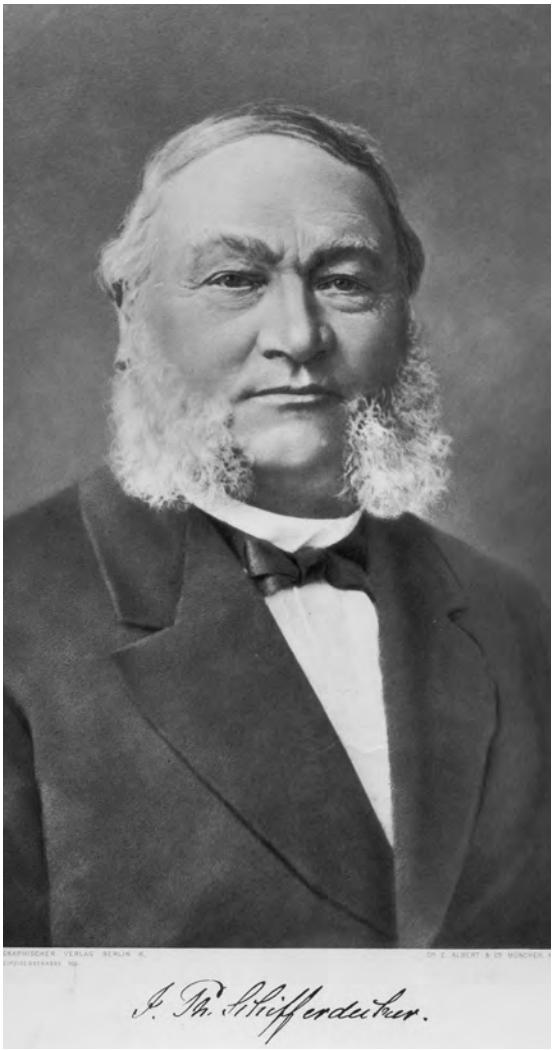
Dr Dominik von Achten
Chairman of the Managing Board

Brewer Johann Philipp Schifferdecker

Johann Philipp Schifferdecker played a key role in the company's founding as provider of ideas. Born on 31 May 1811, he was the eldest child of a Mosbach brewer Johann Georg Schifferdecker (*30/03/1782 Mosbach †21/12/1842 Mosbach) and his wife Eva Maria, née Ritzhaupt, from Sinsheim (*1790 Wiesloch †22/09/1835 Mosbach). The Mosbach Schifferdecker line can be traced back to 1580. In Protestant family tradition, the Schifferdeckers practised the trade of coopers and brewers and were influential as councillors or mayors.

Like his ancestors, Johann Philipp learned the art of brewing in the renowned Mosbach monastery brewery. Later he worked in his father's brewery, which was affiliated to the Deutscher Hof restaurant. In 1835, his mother died, exhausted, at the age of just 45 after giving birth to 24 children.[1]

Johann Philipp was born at a time of extreme population growth. In the Grand Duchy of Baden, the population increased by 25% between 1810 and 1834. Agricultural crises, natural disasters, and crop failures exacerbated the situation. The year 1816 has gone down in history as the "year without a summer". Many young people sought their fortune abroad. By the middle of the century, the wave of emigration had turned into a veritable mass exodus. Despite high birth rates, the population declined.[2]



Johann Philipp Schifferdecker, circa 1880

When his mother's brother offered Johann Philipp his own brewery in the Prussian city of Königsberg (now Kaliningrad, Russia) in 1838, he seized the once-in-a-lifetime opportunity to escape the cramped conditions and lack of prospects at home. Since 1816, his uncle Ritzhaupt had been co-owner of wine merchants Koch & Richter, which ran the bar and wine cellar in the Blutgericht restaurant at Königsberg Castle.

Ritzhaupt had acquired a brewery and several buildings at Tuchmacherstraße in the immediate vicinity of the castle. Johann Philipp began to set up the acquired brewery to suit his purposes as soon as he arrived in Königsberg. He tapped his first barrel just two months later. Unlike his competitors, Schifferdecker brewed bottom-fermented Bavarian beer – a gamble in view of the faltering Königsberg brewery industry. His knowledge of the craft and his uncle's social and economic connections helped him succeed within a short period of time. Customers were enthusiastic about the new beer: Johann Philipp's willingness to take risks had paid off. Just three years after the company was founded, he was able to rent spacious cellar facilities under the castle church. To boost beer sales, Schifferdecker set up a special bar himself in the nearby Gambrinushalle restaurant. Demand eventually increased so much that delivery delays became relatively common.[3]

In the Königsberger Skizzen published in Danzig (now Gdańsk, Poland), the holder of the Kant Chair of philosophy, Karl Rosenkranz, wrote: "... Bavarian beer from the Schifferdecker brewery has become a rival to the porter-like old local Löbenicht beer and its consumption is widely enjoyed."[4]

On the road to success, Schifferdecker married Friederice Louise Antonie Reinicke (*13/08/1821 †28/04/1909) from Königsberg on 8 March 1842. However, the happy events were over-shadowed by the death of Schifferdecker's father. As he felt an obligation towards to his youngest brother Eduard Georg, who was only ten years old, Johann Philipp brought him to Königsberg for education and training. Eduard gladly followed the example of his brother, who was 22 years his senior, and likewise learned the brewing trade.[5]

Dr Johann Philipp Paul Schifferdecker, circa 1875

By the end of the 1840s, the brewery had expanded to such an extent that more land had to be acquired. The production facilities at Königsberg's Tuchmacherstraße, which have grown over the years, could not be expanded further without fundamental alternations and modernisation. Moreover, this work would have necessitated a prolonged temporary shutdown. Schifferdecker therefore looked for ways to relocate production. On 2 August 1849, he acquired a small estate with a farm and inn in the village of Ponarth near Königsberg (now Dimitrovo, Kaliningrad, Russia). After more than ten years of successful entrepreneurship, Johann Philipp had gained enough experience and capital to design a new brewery. The result was a large-scale operation that produced 20,000 tonnes of beer in 1860 and as much as 34,000 tonnes in 1869.[6]

In 1867, Johann Philipp Schifferdecker decided to sell his prosperous brewery, as none of his three children wanted to take it over.[7] A letter that he wrote at the age of 56 has survived, in which he explains his decision to sell the brewery:

"Even if I now refrain from any further examination of the reasons that make a sale desirable to me, I would add that I previously counted on my children entering the business and it remaining in the family, but this has changed due to external circumstances, just as my

Rudolf Heubach, public prosecutor in Bromberg (now Bydgoszcz, Poland), 1889

Sister-in-law Anna Reinicke, wife Friederice Louise Antonie, née Reinicke, Johann Philipp Paul, Marie Olga Luise, Johann Philipp, and Friederike Antonia Helen, circa 1862

advanced age, after so much toil, striving and work, finally demands that I take more rest."[8]

Schifferdecker's son Johann Philipp Paul (*14/01/1846 Königsberg †24/07/1889 Heidelberg) had begun studying chemistry in Karlsruhe and continued his studies in Heidelberg in 1866, where he intended to stay permanently.[9] His younger daughter, Friederike Antonia Helen (*28/02/1852 Königsberg †16/03/1935 Mödling near Vienna), then only 15 years old, and, later, her husband Rudolf Heubach (*1838 †23/01/1895 Bonn) showed no interest in the brewery staying in the family. Johann Philipp Schifferdecker's eldest daughter, Marie Olga Luise (*16/06/1848 Königsberg), also pursued other goals. She later married Königsberg merchant Gustav Schmidt and led an upper-middle-class life.[10]

As Johann Philipp's youngest brother Eduard was already running the technical operations of the Ponarth brewery, Johann Philipp instructed him to look for potential buyers.

On 2 July 1869, Eduard's efforts to sell shares in the brewery were finally successful. In addition to Eduard, several Königsberg merchants acquired shares in the new company, which operated under the name Kommandit-gesellschaft Brauerei Ponarth E. Schifferdecker & Co. Johann Philipp only retained a share worth 100,000 talers (256,500 marks) following the sale.[11] As a silent partner, he continued to pursue the steady growth of the company.[12]

It can be assumed that Johann Philipp occasionally travelled by train to his home town of Mosbach in Baden and to Heidelberg to visit his son. A conversation with a fellow passenger is said to have taken place on one such train journey. In this conversation, Johann Philipp is said to have received the tip to invest his fortune in a Portland cement factory.[13] What is legend and what is fact can no longer be proven today. However, even without external encouragement, a prudent entrepreneur like Johann Philipp Schifferdecker would not have failed to notice that a new boom in the establishment of Portland cement factories had begun. Older, pre-existing cement plants owned by J.F. Espenschied in Mannheim, Chr. Lothary in Weisenau (Mainz), and Dyckerhoff & Sons in Biebrich (Wiesbaden) seemed to show that the industry was indeed very lucrative.

What ultimately motivated Johann Philipp Schifferdecker to look for a location for a Portland cement plant in Heidelberg is unknown. His wish for more peace and quiet, as previously mentioned, would have been fulfilled by building up a new livelihood for his son and involving his daughters accordingly. But despite his advanced age of 62, he still saw himself in a position to actively participate in developing the business. The prospect of seeing his native Baden again was no doubt another reason for his decision. Moreover, he knew that the brewery was in good hands with his brother Eduard.

Foundation of the Portland cement plant in Heidelberg

While Johann Philipp Schifferdecker was still contemplating the idea of building a Portland cement factory in the vicinity of Heidelberg, an opportunity suddenly arose when the Bergheim Mill on the River Neckar was put up for sale. Johann Martin Konrad Reiffel had taken over the mill from his parents on 23 November 1864. In the early 1860s, the City of Heidelberg had attempted to reclaim land through intentional siltation efforts on the left bank of the river above the Bergheim Mill. However, the back-filled material was partially washed away and gradually clogged the mill race for the Bergheim Mill by January 1866. Reiffel was unable to effectively counteract the build-up of sediment and, on 23 January 1869, sued the City for damages and to have the mill race restored. In the course of the proceedings before the Court of Mannheim in Baden, which ordered the City to pay damages in two instances, Reiffel went bankrupt.[14]

When the Bergheim Mill was finally put up for sale as part of the bankruptcy proceedings, it was purchased by Schifferdecker on 2 January 1873 for 152,000 guilders (260,000 marks).[15] The purchase initially seemed to be a stroke of luck, as shortly afterwards, on 24 January 1873, the Karlsruher Zeitung newspaper reported on the purchase of the property:

“Heidelberg, 22 Jan[uary]. As proof of how quickly the value of real estate often increases, I would like to inform you that Mr Schifferdecker, who bought the local Bergheim Mill at auction for 150,000 fl. barely 14 days ago, has already been offered 25,000 fl. more for it by a third party, naturally without success, since the large cement factory to be built there promises even higher profits.”[16]

The Bergheim Mill site offered 90 hp (66 kW) of water power and the possibility of transport by ship. It was a short distance from the railway. The limestone needed for cement production had been found in nearby Rohrbach. The basic suitability of the material seemed to be guaranteed, as there was already a Roman cement factory in the area. However, this assumption proved to be a serious mistake. After a relatively short time, this Roman cement factory went out of business as a result of the “floating” of the product due to the rock’s high magnesia content.

The conversion work on the Bergheim Mill got off to a slow start. By the time the first building application was submitted in July 1873 for the construction of the provisional shaft kilns, half a year had passed without any significant progress being made on the project. This was due not least to the City’s persistent refusal to contribute towards the costs of clearing the mill race, despite being ordered to do so twice by the court. In order to enforce his claims, Schifferdecker went before the Grand Duchy of Baden’s Court of Appeal in Karlsruhe, which handed down a judgement in his favour on 2 October 1873.[17]

After the construction of the intermittent shaft kilns, a phase of experimentation began. Since both Johann Philipp and his son had little knowledge of the Portland cement burning process, the experiments dragged on for over a year. Burning in the shaft kiln was

Drawing of the Bergheim Mill around 1870 by Philibert von Graimberg (*09/07/1832 †28/10/1895)

comparatively uncomplicated. After lighting, the filling and emptying processes took place in a largely consistent manner. At the beginning of the first firing, the amount of firing material had to be determined and the setting procedure had to be tried out once. The extraction of raw material, on the other hand, was problematic.[18]

Limestone quarrying was already carried out in a largely unregulated manner in Rohrbach on the district boundary with Leimen by farmers from the surrounding area. They dug up the stones in their fields and transported them in carts to Heidelberg, 6 kilometres away. This extraction method already made it clear that the important business of raw material extraction was not taken seriously enough. Nevertheless, by the middle of 1874, it seemed certain that the production of Portland cement could be mastered. On 5 June 1874, the company was registered as a general partnership at the local court in Heidelberg. The company had a share capital of 1.2 million marks and was owned equally by the three partners, Dr Paul Schifferdecker, Johann Philipp Schifferdecker, and his son-in-law Rudolf Heubach, previously a public prosecutor in Bromberg (now Bydgoszcz, Poland).[19]

Towards the end of 1874, the factory began to produce cement on a small scale. However, the high magnesia content in the raw material severely impaired the product quality. On a trial basis, the company purchased very hard limestone from Haßmersheim, further up the River Neckar, at high freight costs, as did the Portland cement factory in Mannheim. Clay was ordered in by rail from Langenbrücken.[20]

The annual accounts showed a deficit of 150,000 marks. Schifferdecker's hopes rested on his son Paul. Although Paul had a doctorate in chemistry, he obviously lacked elementary practical knowledge in the field of raw material preparation. The company appeared to be in serious trouble; further experimentation with the raw material would have meant an incalculable financial risk.

Only a scientifically sound approach to raw material extraction could save the company. About ten years earlier, J.F. Espenschied in Mannheim had struggled with similar difficulties and had finally been able to solve this with the help of an experienced chemist, his cousin Dr Richard Espenschied.[21] Johann Philipp Schifferdecker was not proud when it came to business matters and placed an advertisement in the Fliegende Blätter newspaper[22] for an expert plant manager to replace his son. Paul had stepped in at short notice for plant manager Wittwer, who had been dismissed and had gone bankrupt at the Roman cement plant he ran in Neckargemünd. Since Johann Philipp was involved in litigation with Wittwer, he had to advertise covertly by using a box number. It was rather by chance that the chemist Friedrich Schott read the job advertisement. For some time, the cramped conditions in the lime and brickworks run by his father had been getting him down. Against his father's wishes, he applied for the job and was successful.[23]

Family of Friedrich Schott in Seesen, Friedrich with his girlfriend, back row, third from the right, circa 1875

No. 60.

Wir bestätigen hiermit mit Vergnügen, dass wir schon seit zwei Jahren aus dem **Portland-Cementwerk** der Herren **Schifferdecker & Söhne** in **Heidelberg** Portland-Cement in Verwendung haben und zwar erstreckte sich unser Bezug im Jahre 1877 allein auf 87 Doppelwaggons oder 17,209 Centner.

Der Portland-Cement wurde von uns zu den verschiedenartigsten Arbeiten verwendet und hatten wir dabei **nie Veranlassung zu irgend einer Klage,** vielmehr wurden wir stets mit einem gleichmässigen Fabrikat bedient, an welches **wir mit aller Ruhe und Zuversicht die höchsten Anforderungen in Bezug auf dessen Güte stellen konnten.**

Unter den von uns ausgeführten grösseren Arbeiten erwähnen wir namentlich diejenigen in der hiesigen neuerbauten Central-Strafanstalt, woselbst wir bis jetzt sämmtliche Böden der Gefängniszellen, sowie eine grössere Anzahl von Beton-Gewölben mit Schifferdecker'schen Cement ausführten.

Wir können deshalb den Portland-Cement der Herren Schifferdecker & Söhne nur als **ein bewährtes und bestes Fabrikat** Jedermann empfehlen.

Freiburg im Breisgau, den 23. Januar 1878.

Freiburger Cementwaaren-Fabrik
Brenzinger & Co.

No. 95.

Zu dem Bau des neuen Rathhauses zu Barmen ist ein grosser Theil des erforderlichen Cements von dem **Portland-Cementwerk** von **Schifferdecker & Söhne** in **Heidelberg** angeliefert worden und ist die Lieferung **zur vollsten Zufriedenheit der städtischen Bauverwaltung ausgefallen,** was hierdurch gerne bescheinigt

Barmen, den 23. October 1875.

Der Stadtbaumeister

No. 12.

Den Herren **Schifferdecker & Söhne,** Besitzer des **Portland-Cementwerkes** in **Heidelberg,** bezuge ich hiermit auf besonderen Wunsch, dass die im Laufe eines Jahres mit deren Cementfabrikat von mir angestellten Versuche, sowie die beim Bau der Neckarbrücke in ziemlich ausgedehntem Masse gemachten Verwendungen **ein in jeder Hinsicht gutes Resultat geliefert haben** und das Fabrikat von mir den Herren Bautechnikern bestens empfohlen werden kann.

Heidelberg, im September 1876.

H. Baer, Grossh. Ingenieur
z. Z. bauleitender Ingenieur des Neckar-Brückenbaues.

References from cement customers

First shaft kiln, July 1873

The Bergheim Mill converted to a Portland cement factory, 1875

The other partners, Paul Schifferdecker and Rudolf Heubach, also seemed to agree with the decision to employ Schott. Later, too, it became apparent time and again that there was a good, trusting relationship between the Schifferdecker family and Friedrich Schott. On 1 July 1875, Friedrich Schott joined Portland-Cement-Werk Heidelberg, Schifferdecker & Söhne OHG. The Rohrbach deposit belonged to the sharply defined magnesia-bearing strata of the Muschelkalk formation. As early as the beginning of 1876, he therefore succeeded in developing suitable raw material almost free of magnesia in the vicinity of the previous mining sites on the Rohrbach-Leimen district boundary.[24] His professional success gave Friedrich Schott the confidence to reorganise his private life as well. At Christmas 1875, he became engaged to a childhood friend from Seesen and married her on 21 May 1876. A year later he built a spacious villa with a garden on his own land at nearby Mühlstraße (now Fehrentzstraße). His first son, Otto, was born on 6 May 1877; his second son, Ehrhart, arrived on 31 July 1879.[25]

Für eine große chemische Fabrik
wird ein
Ingenieur
zur Leitung der Reparaturwerkstätten, Neueinrichtungen und Bauten gesucht. Die Stelle ist eine dauernde und ziemlich selbstständige und wird gut honorirt. Allgemeine Geschäftstüchtigkeit ist Hauptbedingung, Erfahrung in der Einrichtung chemischer Fabriken erwünscht. Die Anmeldungen müssen ein curriculum vitæ, Angabe der Gehaltsansprüche, des eventuellen Eintrittstermines und Referenzen enthalten, sonst werden sie nicht berücksichtigt. Zeugnisse werden in unbeglaubigter Abschrift erbeten. Gefl. Offerten sind franco sub Chiffre **L. 2169** an ***Rudolf Mosse in Frankfurt a/Main*** zu richten. 4519 c

Advertisement in the “Fliegende Blätter” of 23/01/1875

For Schifferdecker, the consolidation of the company now seemed to usher in the long-awaited peace and return to Königsberg. At least, this is the picture conveyed by the sources that still exist. He is listed in the Heidelberg address books from November 1873 to November 1875.[26] Nevertheless, Johann Philipp Schifferdecker remained a restless spirit in Königsberg until his death. When the brewery in Ponarth was converted into a public limited company in 1885, he sat on its supervisory board.[27]

Cement chemist Friedrich Schott

Friedrich Schott, ca. 1880

Friedrich Schott was born on 27 December 1850 in Gandersheim in the Harz Mountains, the eldest of 19 children. His mother Louise (née Dernedde) described him as a slight and small, but very healthy child. His father Emil was a forester in the service of the Prince of Brunswick. Changes in his father's job led the couple to move to the nearby town of Seesen as early as 1851. A few years later, Louise already had five small children to look after, so Friedrich and his younger brother Hermann started school together in Gandersheim. They stayed with relatives there throughout their years at primary school.[28]

At the age of 17, Schott attended lectures in technical chemistry at the Technical University of Brunswick. The director of the Department of Chemical Technology, Privy Councillor Professor Dr Friedrich Knapp, encouraged Friedrich Schott and sparked his interest in cement production. Schott's father had also already introduced his son to cement production when he tried to produce Portland cement in accordance with an English description. Under Knapp's supervision, Schott investigated the properties of "Scott's cement".[29] Through the agency of his teacher, he obtained a position as laboratory manager at the Vorwohle cement factories, which were then under construction. Here, he was able to actively participate in the construction and commissioning of the Vorwohle and Miesburg cement plants. He was also able to expand his practical knowledge considerably during the construction of the mechanical plants. In his scientific research, he continued his earlier work by investigating the hydraulic properties of annealed gypsum.[30]

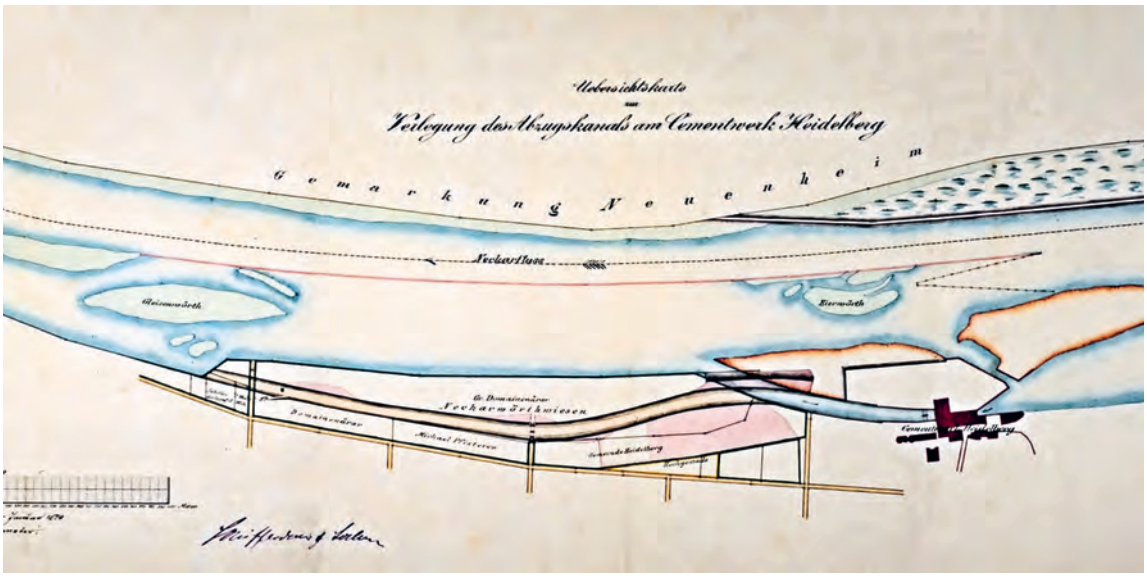
His further studies and research work were now exclusively concerned with Portland cement. Again, it was the hardening processes that Friedrich Schott sought to fathom. He came to the conclusion that all of the hydration processes take place with the formation of different silicates, depending on the process conditions. Apart from his scientific work, however, his job at the Vorwohle Portland cement factory did not seem to offer him any satisfaction. He left to work for his father, who had retired from the Brunswick civil service and in the meantime had acquired a brickyard and lime kiln in Kreiensen. He presumably joined his father's business largely out of a sense of duty, because here, too, his scientific work and the demands of the business were difficult to reconcile.[31]

Expansion of the Heidelberg factory

Due to the company's earnings position, which was only slowly improving, the scope for investment was initially very limited. Gradually, however, the facilities were improved. After four years, the plant was finally profitable. From 1879 onwards, it experienced a rapid upswing. The raw material, which had hitherto been supplied on a contract basis, mainly by farmers, could now be procured on the factory's own account through the acquisition of land and quarries. The lower channel of the water-powered plant was lengthened by 800 metres and deepened, thus almost doubling the output. However, this was only enough to meet the constantly increasing power requirements of the growing factory for a short time. It became apparent that, contrary to Schifferdecker's initial assessment, water power was declining in importance. This initial assessment was based mainly on the fact that Baden had no coal supplies of its own and had to import coal at great cost. However, the situation began to improve with the development of the railway network and the Rhine and Neckar shipping routes. A new upswing was triggered by the introduction of chain-tow shipping on the Neckar in 1878, although the railway was also built along the Neckar. Between Mannheim and Heilbronn, steam tugs with attached barges could now pull themselves upstream on a 115-kilometre-long chain laid in the river. The duration of the journey from Mannheim to Heilbronn was thus reduced to between two and three days; the horse-drawn barges had previously taken five to eight days.

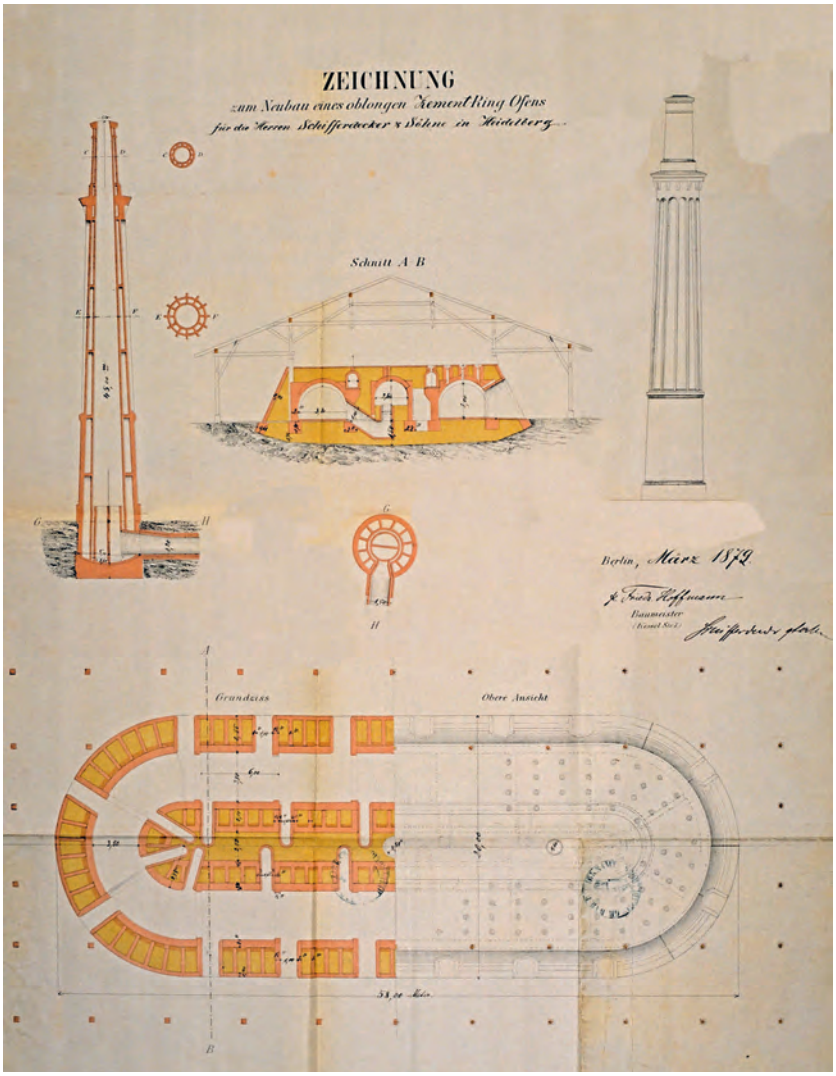
In quick succession, sidings were laid to the main railway in 1881, and a steam engine and a second ring kiln were built in 1882. One major event was the completion of a standard-gauge track connecting the quarries to the main line at Kirchheim. Over its length of 2,120 metres, this track cut through the land of more than 600 farmers. Amicable individual agreements had to be reached with them in lengthy negotiations. With the increase in the transport capacity for the raw material, the so-called Rüdersdorf "fall operation" method[32] was introduced in the quarries in order to improve the mining output.[33] At the same time, the steam engines became considerably more efficient, which contributed to a reduction in the demand for coal.

With the reduction of energy consumption in clinker production, the transport cost factor for the fuels also lost significance. In the course of further rationalisation measures and savings, the costs for raw material transport became increasingly important compared with other costs. In the past, the raw meal had been mixed with water to make a kneadable mass, formed into bricks on ordinary brick presses, and fired in intermittent shaft kilns. The fired bricks (clinker) could only be unloaded by hand after the kiln had cooled down. Here, Friedrich Schott was able to contribute his experience from the Vorwohle Portland cement plants where they had successfully switched to the dry process and replaced the shaft kilns with energy-saving ring kilns. Thus, the installation of dry presses and a ring kiln in 1880 brought

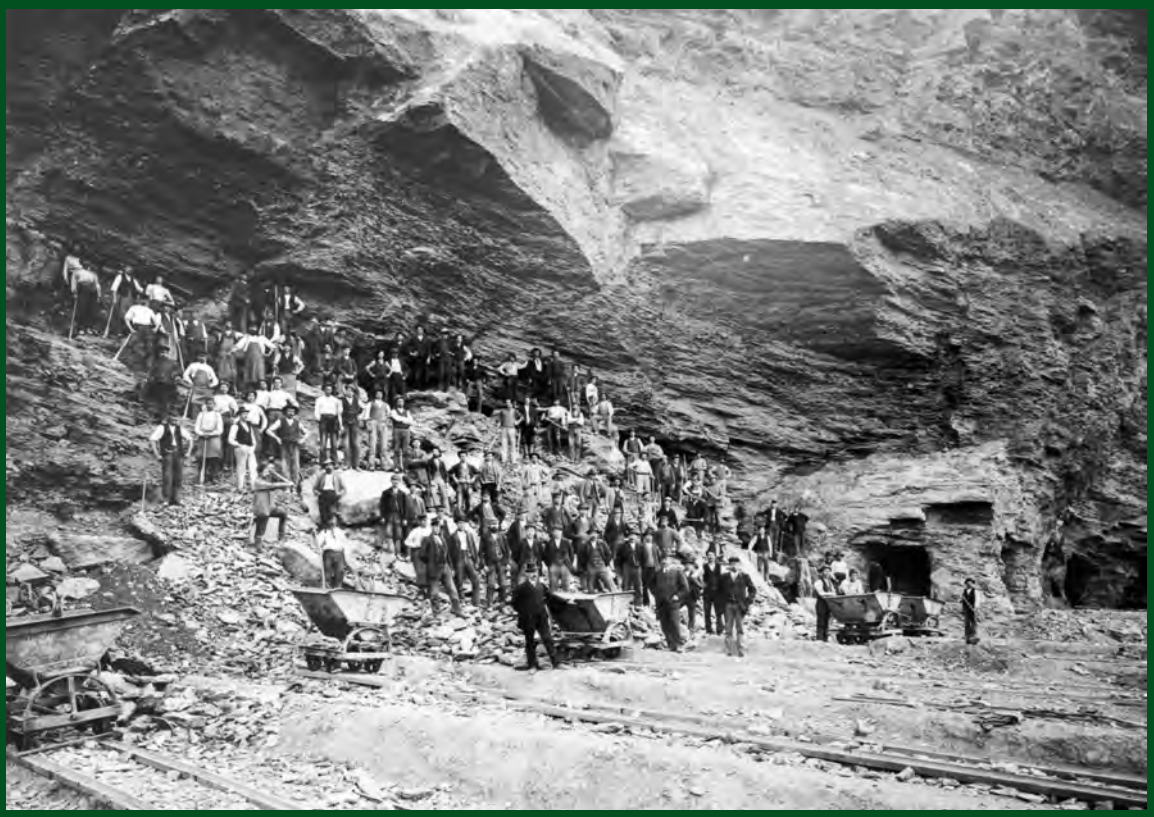


The lengthened lower channel, 19/01/1879

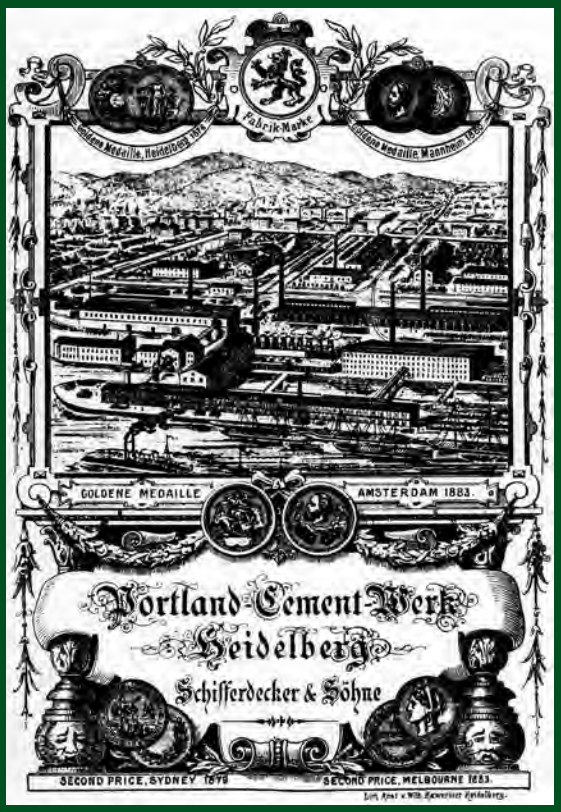
about a fundamental change in the production process. The dry process resulted in considerable fuel savings, as no energy had to be used to evaporate the added water. However, as a disadvantage of the dry process, higher dust emissions had to be tolerated.[34]



Hoffmann ring kiln, March 1879



From 1879, the Rohrbach quarry on the district boundary with Leimen was operated by the company itself. The Rüdersdorf “fall operation” method was the chosen mining technique, 1895.



On the occasion of the 15th anniversary (1887), a lithograph was published as a poster showing the stately factory complex with smoking chimneys. Smoking chimneys were understood as symbols of progress. The lion sits in state above it all.

Exhibition object from the Portland-Cement-Werk Heidelberg for the Chicago World’s Fair in 1893, manufactured by Brenzinger & Cie, Freiburg

Foundation of the public limited company

More than ten years had passed since the company was founded, and the factory had been able to increase cement production from 19,000 barrels (3,420 tonnes) in 1875 to 213,173 barrels (38,371 tonnes) in 1886.
A stately factory had developed from modest beginnings, but at the same time, the first limits to growth, resulting from its physical closeness to the city of Heidelberg, had also emerged. Its immediate proximity to the Botanical Garden,[35] which had only been moved there in 1880, and to the adjacent clinics,[36] which had been in operation since 1877, had already provoked initial controversies. With the submission of the building application for the second ring kiln, massive protests had been voiced from the neighbourhood surrounding the cement plant. In particular, the Academic Hospital Commission of the University of Heidelberg had complained about the smoke and dust nuisance and demanded this be addressed. Another common complaint from admirers of the city of Heidelberg was that the castle was no longer visible due to the clouds of smoke.[37]

Nevertheless, the new facilities, albeit with increasing licensing requirements, brought about a continuous increase in cement production. Continued investment in a new steam plant and mill in 1885, as well as the purchase of new steam turbines in 1887 and another steam engine plant in 1888, increased productivity and cement output by leaps and bounds to 369,342 barrels (66,482 tonnes) in 1888.[38] The Portland-Cement-Werk Heidelberg, Schifferdecker & Söhne OHG, had become a flourishing company.

Fortunate circumstances and decisive individuals had contributed in equal parts. Thanks to his far-sighted entrepreneurial spirit, Johann Philipp Schifferdecker had founded a company with development potential, and he had succeeded in correcting initial weaknesses and finding a capable plant manager in Friedrich Schott.

From the mid-1880s onwards, the consumption of Portland cement increased considerably, and at the same time, prices reduced. Numerous large construction sites such as weirs, locks, and port facilities on the Rhine, Moselle, Lahn, and Neckar as well as bridge, railway, and tunnel engineering projects in Bavaria, Baden,

Plan of Heidelberg from the cement plant to the Marstall complex, 1885

Letterhead from 1895. On 6 April 1891, the company name of the Portland-Cement-Werk Heidelberg, Schifferdecker & Söhne, was changed to Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne.

Advertisement for the company Portland-Cement-Werk Heidelberg Schifferdecker & Söhne in the commemorative chronicle of the fifth secular celebration of the University of Heidelberg, 20/10/1886

Württemberg, Prussia, and Amsterdam were supplied by the plant. The cement was also used in the construction of the municipal sewage systems in Heidelberg, Karlsruhe, Augsburg, Munich, and Zurich. As a reaction to the falling cement prices, a concrete products factory was built on the company premises in 1888 to expand its product range.[39]

On 1 October 1887, Johann Philipp Schifferdecker died in Königsberg.[40] After his death, his heirs and former partners Paul Schifferdecker[41] and Rudolf Heubach looked for a new legal form for the company. Following the trend of the time, the general partnership was converted into a public limited company with a share capital of 5.5 million marks on 18 March 1888. The shares initially remained in the family's hands.

Paul Schifferdecker held the largest stake at 2,250 shares of 1,000 marks. Rudolf Heubach received 1,750 shares, his children Magarete and Rudolf 250 shares each, and Olga Schmidt, Paul Schifferdecker's second sister, 1,000 shares. The new company operated under the name Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne.[42] Paul Schifferdecker died the following year and, on 23 January 1895, the last founding shareholder Rudolf Heubach also passed away. The company's first Managing Board consisted of Friedrich Schott (technical director), Otto Hornung (accountant), and Otto Wagenbichler ("cashier"). For Friedrich Schott, this meant due recognition of his merits. He chaired the Managing Board for a total of thirty years, holding the title of Managing Director from March 1916.[43]

Otto Wagenbichler retired due to ill health on 1 April 1893. Carl Leonhard, former Commercial Director of Portland-Cement-Fabrik Halle AG, joined the company in his place. He remained with the company as a member of the Managing Board until spring 1916 and then as a member of the Supervisory Board until his death in 1930.[44]

View of Heidelberg-Bergheim from the Molkenkur spa building with the Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne in the background and the former Heidelberg railway station in the foreground, circa 1894

Major fire in Heidelberg

The decisive turning point in the further development of the factory came on 4 February 1895 when the plant, which consisted largely of wooden structures, burned to the ground. Only the brick mill building, the ring kilns, and the steam engines survived the fire almost undamaged. On 5 February 1895, the Heidelberger Zeitung newspaper reported:

"A conflagration that far surpasses any fire that has occurred here for decades, and, apart from the city fires of earlier centuries, is probably the largest such case that has ever occurred here, must be recorded in the annals of our city. ... The fire had already spread over a vast area within a quarter of an hour of its outbreak. The fire found ample fuel in the coal supplies and in the wooden material of the cooperage, just as the entire wooden structure of the factory and storage rooms provided the ideal ground for the flames. According to everything we have been able to learn so far, the fire started at a quarter to nine at the old mill, while the people were having their evening meal in the canteen. Supervisor Schulze was the first to notice the fire and report it to the management. Almost at the same time, however, reports came in that a fire had also broken out in the engine house and in a place to the west. The reasons why the fire broke out almost simultaneously in three different and physically separate places have not yet been explained. The investigation will have to provide the answers. The fire spread from roof to roof, from building to building. In order to prevent a steam boiler explosion, the engineer in charge allowed the steam to escape from the boilers, which added an eerie music that could be heard from afar to the powerful blaze. The fire brigade could do nothing directly against the fire and had to limit themselves to protecting the neighbouring buildings. The villas at Mühlstraße were particularly at risk."[45]

In the immediate aftermath, the critics of the factory were quick to demand that a new operating licence be refused, and another location be found for the factory instead. The factory management initially tried to obtain permission to rebuild but met with rejection from the City. After several fire insurance policies had covered the damage amounting to 1.27 million marks, they attempted to get permission for provisional reconstruction and temporary operation in order to avoid loss of earnings and to be able to retain customers.

Even during the negotiations with the City about the provisional reconstruction, the company looked for a new location close to the raw materials and found one in Leimen. As early as 13 March 1895, Friedrich Schott signed a contract with the municipality of Leimen to locate the cement plant inside Leimen's boundaries. In contrast to Heidelberg, Leimen had even undertaken to assist the plant by offering tax reductions on the purchase of land.[46] The municipality of Nußloch had also been included in the search for a location because of its high-quality limestone deposits, but was eliminated due to its poor transport connections. In the end, the existing connecting track and the settlement subsidies tipped the scales in favour of re-establishing the plant in Leimen. Planning and construction preparation work began immediately. On 5 April, the City of Heidelberg finally approved the temporary continuation of operations at the Heidelberg plant.[47]

The decision to relocate to Leimen met with considerable approval beyond the region, as here in Brunswick newspaper the Braunschweiger Tageblatt on 19 March 1895:

"Reports from Heidelberg state that the Portland cement plant is moving to the village of Leimen and the ugly stain on Heidelberg's beauty will be erased! With the support of the State of Baden, the City of Heidelberg will purchase the extensive and highly valuable ruined premises for 900,000 marks. The administration of the factory will remain in the city and thus the contribution of the cement works to the City's levies will be retained. The Citizens' Committee has yet to approve this solution, which is as heart-warming as it is clever, and in which all friends of Heidelberg have an interest."[48]

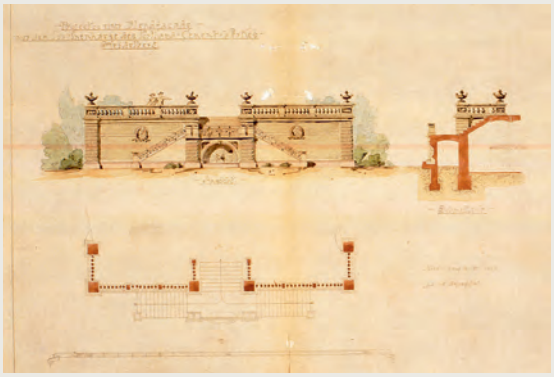
Former mill building at the Bergheim Mill. After the installation of new turbines, it had an output of 500 hp. Now the clubhouse of rowing society Rudergesellschaft Heidelberg 1898 e.V., 1900

The municipality was prepared to make concessions in view of many complaints about smoke and dust nuisance, fire hazards, and the factory being perceived as damaging to the scenery. In the end, the City of Heidelberg acquired the approximately 6-hectare site in cleared and unencumbered condition for 900,000 marks. In return, the Portland-Cement-Werk Heidelberg, vorm. Schiffer-decker & Söhne, had to commit to keeping the company administration in Heidelberg for at least another 15 years and to pay 20,000 marks to the City each year. The purchase price was paid in three instalments on 1 April 1897, 1900, and 1903. Handover of the factory land to the City took place on 1 November 1897, by which time most of the buildings had been demolished.[49] After the decision was made to keep the headquarters in Heidelberg, the question of where to locate it had to be resolved.

Since the mill building was damaged, but the water turbines underneath still needed to supply electricity for the new plant in Leimen, it made sense to rebuild the floor above it and house the new administration offices there. It is unclear whether the rooms were used for administrative purposes at all.[50] The head office moved into a building at Bergheimer Straße.

This meant a great financial sacrifice for Heidelberg. All attempts to quickly sell on the land and turn the area into an up-market residen-tial neighbourhood failed due to lack of demand. For years, the derelict plots had to be leased out for various purposes. The remaining turbine house in Heidelberg was connected to the new plant location in Leimen by an overhead cable.

Following redemption of the water rights, rowing society Rudergesellschaft Heidelberg 1898 e.V. has been using the turbine house since 1932. The thermal baths were opened on the adjoining site to the north on 31 July 1939. Only the quay facilities remained in operation for a few more years.[51]



Unrealised project for a blind wall in front of the turbine house. Design by the architect Hermann Behaghel, who also planned the Schiffer-decker villa at Neuenheimer Landstraße 101–103 in Heidelberg (before 1888) and the administration building for the new plant in Leimen, 1897.

Raw mill building, in front of it a pan grinder for pre-crushing

Ring kiln III in the foreground behind the shed, raw mill building on the left behind it, cement storage and shipping hall at the back on the right

Mill race with the cement mill building on the right

Ring kiln on the right with the raw mill building behind it

Almost undamaged Sulzer steam engines

Workers in the old steam-powered cement mill

Reconstruction and early years in Leimen

After the fire at Portland-Cement-Werk, vorm. Schifferdecker & Söhne in Heidelberg on 4 February 1895, the old location, which had been chosen in 1873 because of its water power and the advantages of the River Neckar as a transport route, had to be abandoned. The relocation of the company offered the opportunity to choose a new location to suit the changing requirements of the industry. Proximity to raw materials had become the dominant location factor for all new companies of the time. The connecting track between the Rohrbach quarry and the Kirchheim railway station, which had existed since 1883, and advances in steam engine technology, which was increasingly replacing hydroelectric turbines, now made it possible to choose the location with raw materials in mind.

Carl Leonhard (*30/12/1848 Reichenbach †04/04/1930 Heidelberg), Managing Board 1889 to 1916, 1898

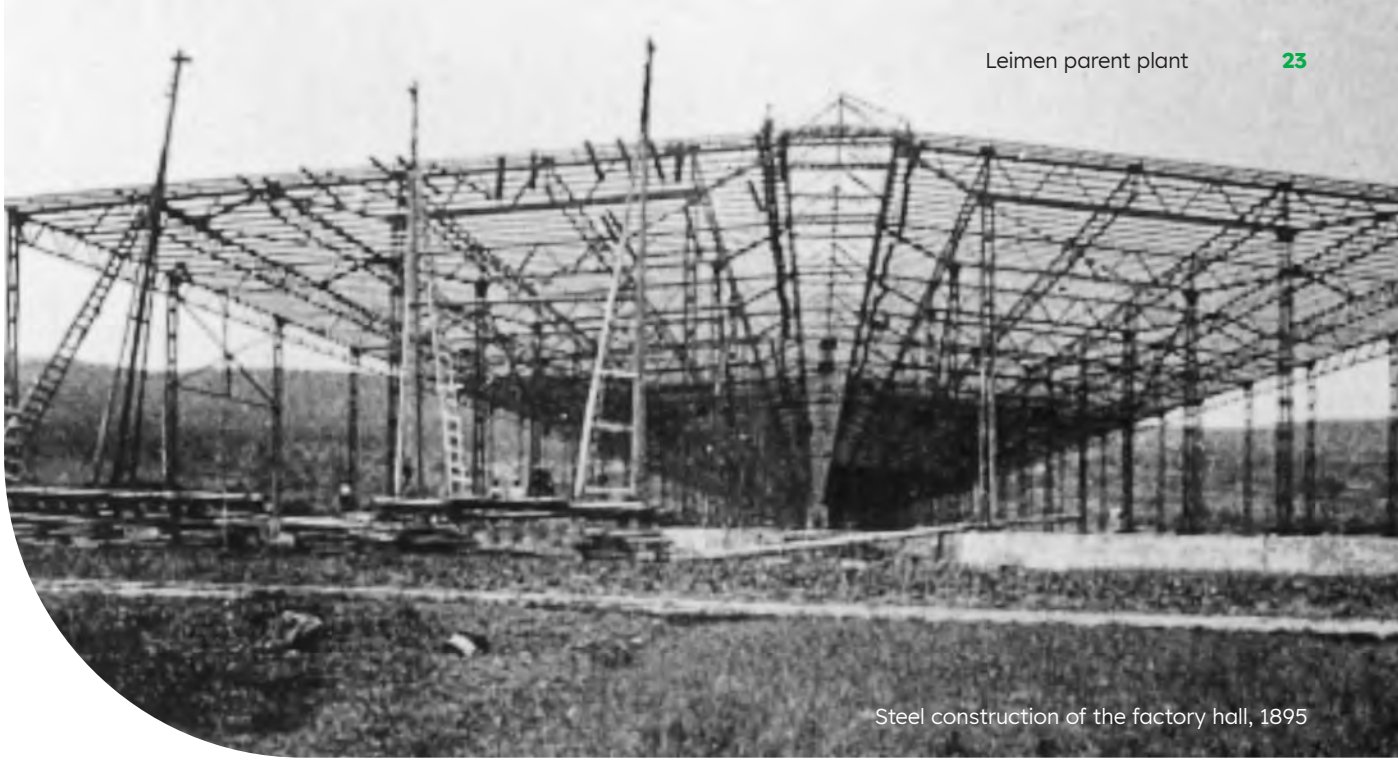
At the Heidelberg location, 300,000 barrels (54,000 tonnes) of cement could still be produced under temporary roofs during 1895, which meant that customers could be retained and supplies to them continued. On 24 November 1895, Otto Hornung died unexpectedly as a result of a stroke. Management of the company then fell to Friedrich Schott and Carl Leonhard alone.

Planning and construction preparation work for the new factory on the outskirts of Leimen began immediately. The largest industrial building in the German Empire was built here in accordance with Schott's plans. A factory building 485 metres long and 60 metres wide was erected on wrought-iron pillars filled with concrete.[52]

The factory started production at the end of December 1896. It was built according to modern process engineering standards.[53]

"The most important aspect of the whole plant is a good overview of the operation and a uniform arrangement of the individual operating parts, in that all parts are systematically arranged along a longitudinal axis. The constantly repeating devices for achieving a thorough mixing of large masses guarantee the high uniformity of the product. The endeavour to transport and process the goods only by machine and without human labour gives the whole factory a special character."[54]

The entire production facilities were housed under one roof: the limestone drying plant, the limestone mills with silos and stone presses, six ring kilns, clinker storage rooms, the cement mill, and cement silos, and the packing house



Steel construction of the factory hall, 1895

with a 100-metre-long storage room. A track ran along the northern side, which was used to supply coal to the boiler and machine houses located there.[55]

Only the potentially fire-prone cooperage and some ancillary operations were located outside the building. The 22 steam boilers and engines had a total output of 4,000 hp. A single electric motor providing 360 hp was partly fed from the turbine house of the burnt-down cement plant in Heidelberg, 9 kilometres away, which still exists today.

The first rotary kilns were introduced in Germany in 1896, but Schott first set up ring kilns in Leimen, which he had already tested in Heidelberg. The anniversary publication in 1898 stated that:

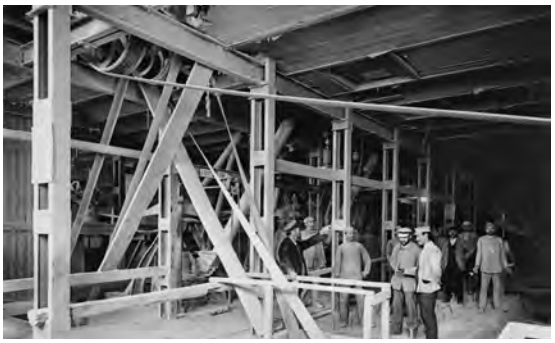
“The design of our ring kilns has been improved to such an extent that a sharper firing is scarcely conceivable, since it often happens that the entire contents of a chamber form a dense coherent molten mass right down to the bottom, which is very difficult to break out.”[56]

Regulating the temperature as well as loading and unloading the ring kilns were very time-consuming tasks. The unloading of the fired clinker bricks in particular was hard physical work carried out at high temperatures. Foreign workers, primarily from Italy, were employed to break the clinker bricks out of the kiln chambers.

Despite strong competition, sales volumes increased and very soon made it necessary to expand production, leading to the addition of a seventh large ring kiln in 1898. The increase in production on this kiln line was only possible through a simultaneous increase in the number of workers. Annual production in 1898 was 700,000 barrels (approximately 126,000 tonnes). A peak of 1,110 employees was reached in 1899.

View from the east overlooking the new plant. On the left, the seventh ring kiln erected in 1898. In the foreground, the covered dumper railway flyover, 1900

Commercial office, 1900



Griffin raw mill, 1900

Griffin cement mill, 1900

Packing hall with semi-automatic bagging into jute sacks, 1900

Ring kiln hall with backfilled clinker heaps, 1900

The limestone was transported from the quarries to the factory by dumper railway. At the plant, the contents of the tipping wagons were emptied into jaw crushers and crushing screws and from there distributed onto twelve drying drums. The rocks fell from these into crushers that reduced them to the size of nuts. This material was then lifted into storage bins.[57]

From the storage bins, the crushed rock was fed into the 30 Griffin mills and from there into the 10,000-tonne raw meal silos. The raw meal was analysed every hour. The 35-metre-long raw meal silos were filled from front to back in inclined layers. Emptying was done by a horizontal transport screw that fed the raw meal to the kilns.[58]

"The clinker falling out of the cooling drum is weighed on an automatic scale and fed through a shaking chute to a bucket elevator, which lifts the clinker onto a chute 10 metres higher up, which throws it onto a huge heap of clinker. Underneath this heap is a third conveyor channel with the help of which the clinker is fed to the pan grinder for pre-crushing after it has been deposited. A further 30 Griffin mills complete the grinding process. Now fully prepared, the cement powder is collected in huge bins, a single one of which is capable of holding about 150,000 standard barrels of Portland cement."[59]

The six cement silos had a capacity of 35,000 tonnes. The cement was filled into sacks directly from these silos. The cloth sacks were fastened to the scales by a leather strap and, once the weight was reached, tied with string, later replaced with wire. A pipe chute sent them straight into the wagons. When paper sacks were used, they had to be loaded into the wagons by handcarts.[60]

The packing house, which used to be operated by a rope drive from the cement mill, was given an independent drive in 1917 using a 150 hp diesel engine, which came from the demolition of the Berghausen plant. By the end of the 1930s, all the drives were electric.[61]

A large proportion of the production output that was delivered to tropical regions was packed into wooden barrels with a capacity of about 100 litres (net weight about 170 kg). From the storage hall, the loaded wagons were pulled to the railway station in Kirchheim by the factory's own locomotives. In the summer months, up to 120 railway wagons could be loaded this way each day. The cooperage, which produced 650 barrels a day, employed 100 workers at times. After the closure of the cooperage in Leimen in 1934, Weisenau took over exports due to its favourable location on the Rhine.[62]

Merger of Portland-Cement-Werke Heidelberg und Mannheim

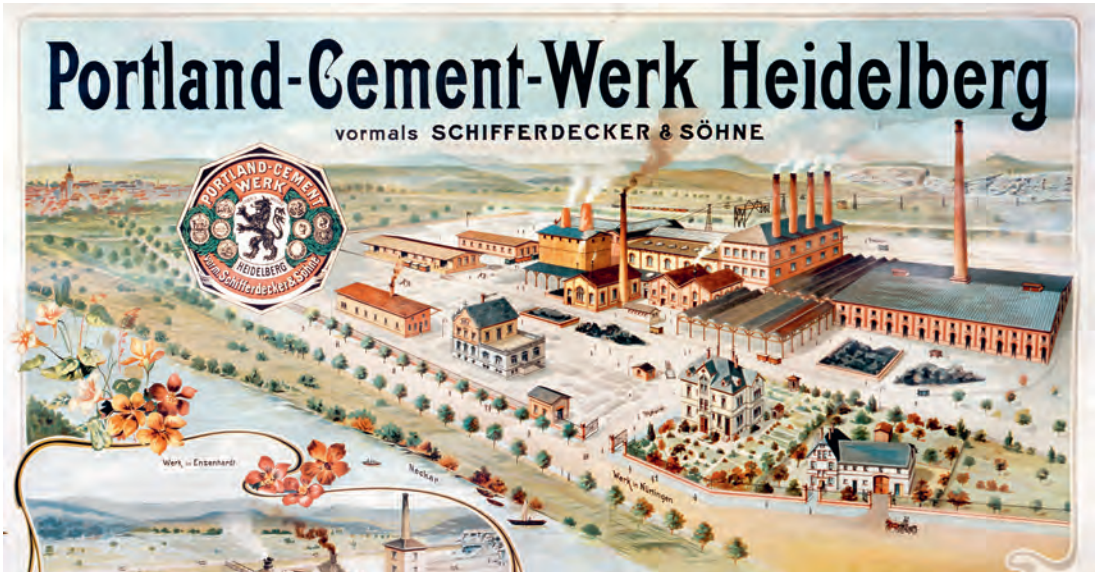
After the sales of Portland cement had developed well in the 1880s, the number of newly founded cement factories also rose sharply. By the end of the decade, however, production grew faster than demand. In the period between 1877, the founding year of the Verein Deutscher Portland-Cement-Fabrikanten (Association of German Portland Cement Manufacturers), and 1892, 31 new cement plants had joined the association. As there were no mandatory cement standards, the products varied greatly. In addition, some cement plants engaged in unfair competition by using various admixtures. In the Association of German Portland Cement Manufacturers, an interest group had already been established since 1887, mainly focused on technical matters; it would now also deal with commercial issues. At the beginning of the 1890s, a sales association of various northern and eastern German groups was formed. In these syndicates, some of which were still loose, not only were prices and sales conditions fixed, but production was also regulated by quota sales.[63]

The years 1889 to 1893 were characterised by stagnating to declining demand, which led to 13 southern German plants joining together in a loose convention. From 1894 onwards, foreign business picked up again, but remained behind the increases in production. However, as a result of strong population growth and the associated growth in construction activity, demand on the domestic market also rose again temporarily. This favourable economic development led to a second wave of start-ups. High dividends attracted speculators and investors inexperienced in Portland cement production. The number of Portland cement factories, mostly public limited companies, rose from 40 to 75 in the period from 1894 to 1900.[64]

The newly founded factories often failed to meet expectations. Even in the boom years of 1898 and 1899, 10% of all plants operated below break-even point. They had a hard time compared with the established factories, which paid out an average dividend of 12.8%. Following initial dividends, often paid out despite losses, payouts quickly fell to zero.[65]

During this time, there was also a change in the chairmanship of the Association of German Portland Cement Manufacturers, with Friedrich Schott succeeding Hugo Delbrück in 1899. During his ten years in office, not only were the cement standards and an association laboratory created, but the association's work also developed significantly. In the same year, Schott also became President of the Heidelberg Chamber of Commerce. In these positions, he acted with the conviction that the southern German cement industry could

Cement labels of the merged companies, 1901



Poster showing the Portland-Cement-Fabrik Matthäus Lude in Nürtingen, taken over in 1899

only survive if an understanding were reached between the most influential companies. Following renewed economic crisis and reflection on the experiences of the 1889–1893 crisis, most manufacturers were ready to negotiate. In 1900, Schott succeeded in founding the Süddeutscher Portland-Cement-werk-Verband (South German Portland Cement Works Association). Considering the conflicting individual interests within the cement industry at this time, which were geared towards price and takeover battles, this achievement was a testament to Schott's diplomatic skills.[66]

The South German Portland Cement Works Association tried to avoid ruinous competition and combat unsyndicated new companies by means of shipping quotas and standardised prices. In 1898, the company management in Mannheim also blocked a competitor by purchasing land in the Weisenau neighbourhood. However, despite all attempts, it was not possible to prevent overproduction and stabilise cement prices. In the founding phase of the Heidelberg cement plant in 1873, the cement price reached a peak of 60 marks per tonne (10.80 marks per 180 kg standard barrel). From there, it fell continuously until 1906 to values around 35 marks (6.30 marks per standard barrel).[67]

Numerous speculative start-ups from the 1890s went bankrupt in a short time or had to sell. When the Matthäus Lude & Co. Portland cement plant in Nürtingen, founded in 1896, ran into liquidity difficulties in 1899, the opportunity arose for the Portland-Cement-Werk Heidelberg to acquire it. This first expansion step was soon to be followed by numerous others.[68]

Poster of the Portland-Cement-Werk Diedesheim-Neckarelz AG, founded by a banking consortium in 1897, circa 1900

After sales volumes declined from 1901 onwards, and with production increasing, there was a sharp drop in prices.[69] The Mannheimer Portland-Cement-Fabrik, located in the inner-city area of Mannheim, was particularly affected by the price falls due to its high production costs. Nearby residential buildings stood in the way of the competitive expansion of the Mannheim site, and people increasingly complained about the dust and smoke nuisance.

Employees of the Mannheimer Portland-Cement-Fabrik before the merger. Christoph Riehm on the left side of the table, Wilhelm Merz in the middle, 1901

In addition, there was the issue of having no quarry in the immediate vicinity, meaning that the raw material had to be transported over long distances.

Personal contacts had existed between the Mannheim and Heidelberg Managing Boards for some time. Under external pressure, the Portland-Cement-Werke Heidelberg, vorm. Schifferdecker & Söhne AG and the Mannheimer Portland-Cement-Fabrik AG decided to merge on 5 June 1901. The new company, based in Heidelberg, traded under the name "Portland-Cement-Werke Heidelberg und Mannheim Actiengesellschaft". The share capital of the new company amounted to 11 million marks. The shareholders of the Mannheimer Portland-Cement-Fabrik were offered an exchange of shares in a ratio of 10:17, which corresponded to the performance of the previous companies. In 1901, the shipments from the Mannheim plant amounted to 32,802 tonnes and those of the Weisenau plant to 55,623 tonnes. The Heidelberg plants, Nürtingen and Leimen, shipped 22,245 tonnes and 105,524 tonnes of cement respectively in the same year.

After the merger of the two companies, production increasingly shifted from Mannheim to Leimen, finally leading to the closure and demolition of the Mannheim plant in 1902. Christoph Riehm and Wilhelm Merz remained members of the Managing Board of the new company.

Packer and carrier at the Mannheimer Portland-Cement-Fabrik, 1897 (Source: Marchivum)

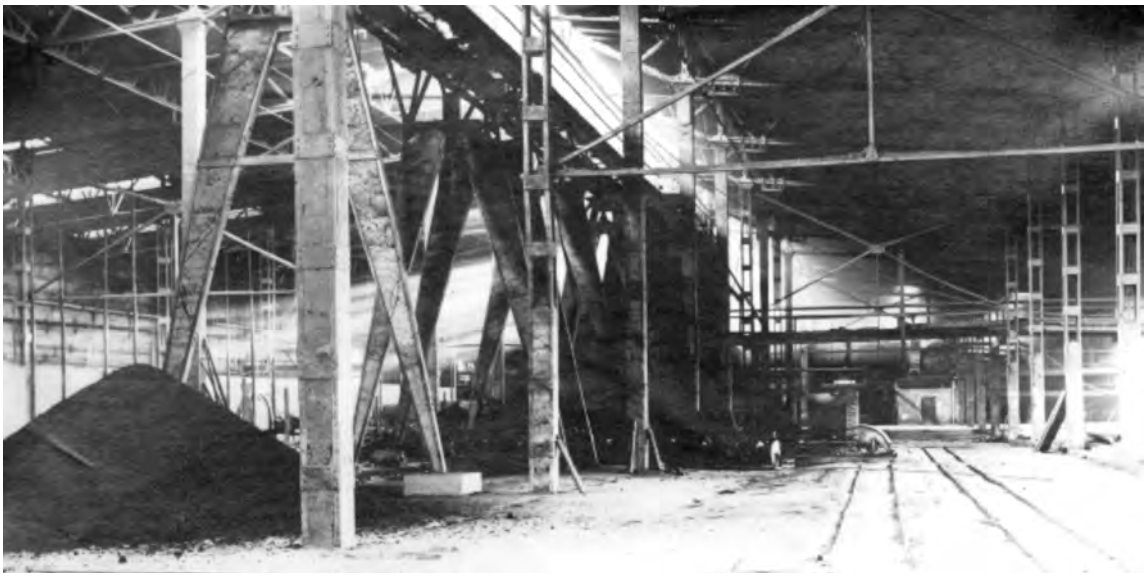
Portland-Cement-Werke Heidelberg in Leimen

At the turn of the century, the Heidelberg Portland cement plant in Leimen had already reached its production capacity, despite its relatively modern construction. To achieve further increases in production capacity, it was essential to update the kiln system. Operating the existing ring kilns required a large number of workers for loading and unloading. By 1898, a seventh large ring kiln had been added and, with 1,100 employees, workforce peaked. The first rotary kilns were installed in 1902, as the second factory in the German Empire to do so. In the USA, these new kilns had already been in operation for several years. By 1910, production had increased to 1.5 million barrels (270,000 tonnes). Friedrich Schott immediately recognised that it was possible to benefit from exploiting waste heat in rotary kiln operation by installing boilers and secured a patent to that effect. This was the first significant step towards conserving energy. Until then, the steam produced by waste heat had had to be generated in Kuhn battery boilers. The rotary kilns also made it possible to automate the loading and unloading processes and led to more uniform firing. The comparatively rapid cooling of the clinker also increased its reactivity.

As the rotary kilns set up in Leimen were among the first in Germany, the initial difficulties associated with this new technology also had to be tackled here. This task fell mainly to Wilhelm Merz. In particular, the excessively thin steel kiln barrels caused problems. In the area of the highly loaded firing zone, the barrel sections, on which the weight bearing rollers were also pressing, began to warp. The deformed kiln barrels in turn made the internal brick lining almost impossible to maintain. Design

Administrative building at Rohrbacher Straße 95 in Leimen, 1900

Old Kuhn steam engine from the Heidelberg plant, 1900



Clinker stock in the first days of September 1911: "... the pride of the chief miller and the suffering of the kiln master!"

improvements were achieved by moving the barrel rollers to the kiln head. The metal sheets on the water jackets for the cooling drums also proved to be too thin. The poorly designed kiln drives were another weak point.[70]

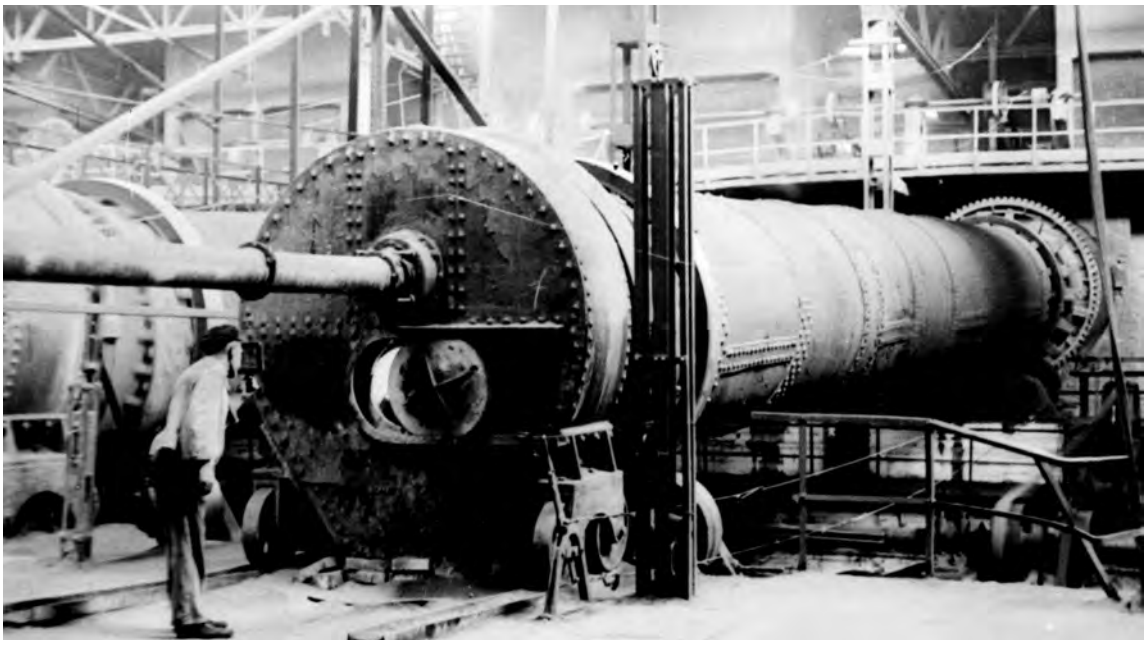
A 400 hp (300 kW) converted Sulzer machine from the Heidelberg factory had so far powered the rotary kilns. In 1917, a second-hand 700 hp (500 kW) three-cylinder steam engine was acquired.[71]

Dust removal from the drying drums was also inadequate. Since the dust deposition chamber was connected to the chimney, the moist dust coming out of the chimney fell in the immediate vicinity of the factory, clumped together into small lumps.

"Often, gentlemen dressed in black who had stood in front of the administration building for a short time could be seen leaving covered in 'snow'."[72]

Not only complaints from the people, but also the fact that the finest and most valuable part of the raw material was being lost, demanded a remedy. A new bag filter system brought a significant improvement.[73]

But the raw mill also had various difficulties in achieving the necessary quantities. On the one hand, a series of very cold winters meant that the Leimen quarry could not supply enough material; on the other hand, the drive power of the Griffin mills was insufficient.



Firing floor at the waste heat kiln, circa 1905

Coal-fired drying drums, before waste heat recovery, 1900

As a result, a new horizontal Görlitz tandem steam engine with an output of 1,400 hp was installed in July 1911. In addition, an 800 kW (600 hp) electric motor was used for the primary crusher. With the improvement to the raw meal preparation process, the clinker production of the kilns gradually increased.[74]

Increasing clinker production made necessitated changes at the cement mills. Disadvantageous environmental factors made themselves apparent here, too. Several years of low water levels in the Neckar and the associated poor rates of electricity production from the Heidelberg turbine house made increased use of the steam engines necessary.

The problem was exacerbated by the addition of four new Griffin mills to the existing 32, which required the mills to frequently be disengaged from transmission.[75]

The drive for the cement mills was replaced several times. Initially, it was driven by a Kuhn steam engine. From 1912, a 2,700 hp Görlitz tandem steam engine was available and, from 1924, additional electric motors with a combined output of 2,300 hp.[76]

Despite the difficulties with the drive units, the cement mills proved to be highly efficient. As a result, the stocks of clinker fell every year because the kiln operation could not keep pace with production. In September 1911, an all-time low of less than 10,000 tonnes was finally reached, which meant that the kilns could simply not keep up with production levels from the mill.[77]

With the installation of another new 15th kiln in 1911, the cement grinding capacity also had to be further enlarged. Between 1912 and 1935, experiments were carried out with numerous mill systems. In 1912, large pendulum mills and Fuller mills were installed. The Fuller mills, which did not prove successful, were dismantled in 1915. In 1924, the so-called tube ball mills, the “Ergo” and “Pfeiffer” systems, were installed. Within ten years, these mills also proved to be inadequate. It was not until 1935, with the installation of four powerful ball mills, each with 700 hp (500 kW) electric motors, that these problems were overcome.[78]

Wagon loading in the storage and shipping hall, 1900

Everything from one source

In times of increasing economic activity in the years 1902 to 1911, the factory management strove to manufacture as much as possible in-house so as not to be constrained by the long delivery times of the machine factories. At that time, the Leimen plant operated its own machine factory with up to 350 employees. Here, mills and transport equipment were manufactured according to the plant's own designs.[79]

In addition, the Leimen plant took over the function of a central repair workshop for the other company plants. The repair workshops consisted of a locksmith's, a lathe turner's, and a forge. The rapid increase in production had meant that numerous pieces of equipment could no longer withstand the strain. This led to a sharp increase in repair costs and the workshops becoming overloaded. The additional demand on the repair workshops by the plants in Nürtingen, Lochhausen, Offenbach, Neckarelz, and Budenheim necessitated an expansion. At the beginning of 1911, two old ring kilns were demolished to make room for an assembly hall 100 metres long and 10 metres wide.[80]

In 1908, a foundry with a pattern-making shop was added. At the end of 1911, a steel foundry with a cupola furnace and a Bessemer converter was added. The chilled cast iron mill parts that were prone to wear, such as roller bodies and mortar rings, which came from the USA, were particularly expensive. With the installation of a hardening furnace, attempts were made to produce these parts in-house.

During the First World War, the foundry was used to produce ammunition. After it closed in 1933, machinery production was also discontinued and only the repair business continued.[81]

Forge, 1900

Annealing of the Bessemer converter in der foundry on 20 December 1911. On the left, wearing a white coat, the plant manager Dr Ehrhart Schott, younger son of Friedrich Schott

Concrete products factory on the west side of the plant, 1900

To promote cement sales, a concrete products factory was affiliated to the plant. Supplying various products made using cement, the factory initially operated in Heidelberg from 1888, later relocating to Leimen with the main plant. From 1905 to 1914, it was leased to former cement plant employees, Hergert and Lay. From 1919 until its closure in the 1970s, it was again operated by the company. In the early days, the factory's primary purpose was not to make a profit, but to familiarise customers with the possible applications of cement. Over time, the concrete plant produced pipes, fence posts, and concrete beams for ceilings, among other things.[82]

In 1911, total shipments amounted to 246,800 tonnes, 187,850 tonnes of which (3,757,027 units) were bagged goods. The remainder of 58,950 tonnes (327,500 units) were wooden barrels, of which 195,878 (including 32,148 tin drums with wooden bottoms) were manufactured at the Leimen plant. Analysis of these figures reveals that more than 650 barrels were produced daily in the cooperage in conjunction with the sawmill. The use of cotton and jute sacks in lighter and heavier grades also involved considerable effort. Just like the wooden barrels, the sacks that were sent out were returned, dusted off, and repaired in the sack mending workshop. Separating out sacks originating from competitors, which accounted for roughly 7% of the total, was a painstaking task for the employees. In 1911, 1.2 million sacks were mended in day and night shifts on 24 sewing machines. Cotton sacks proved to be the most durable, accounting for the lowest proportion of unusable returned sacks at 3%. Wastage among the other sack types, however, was not significantly higher, with an average loss of 4%.[83]


HEIDELBERGER
CEMENTWAAREN-INDUSTRIE

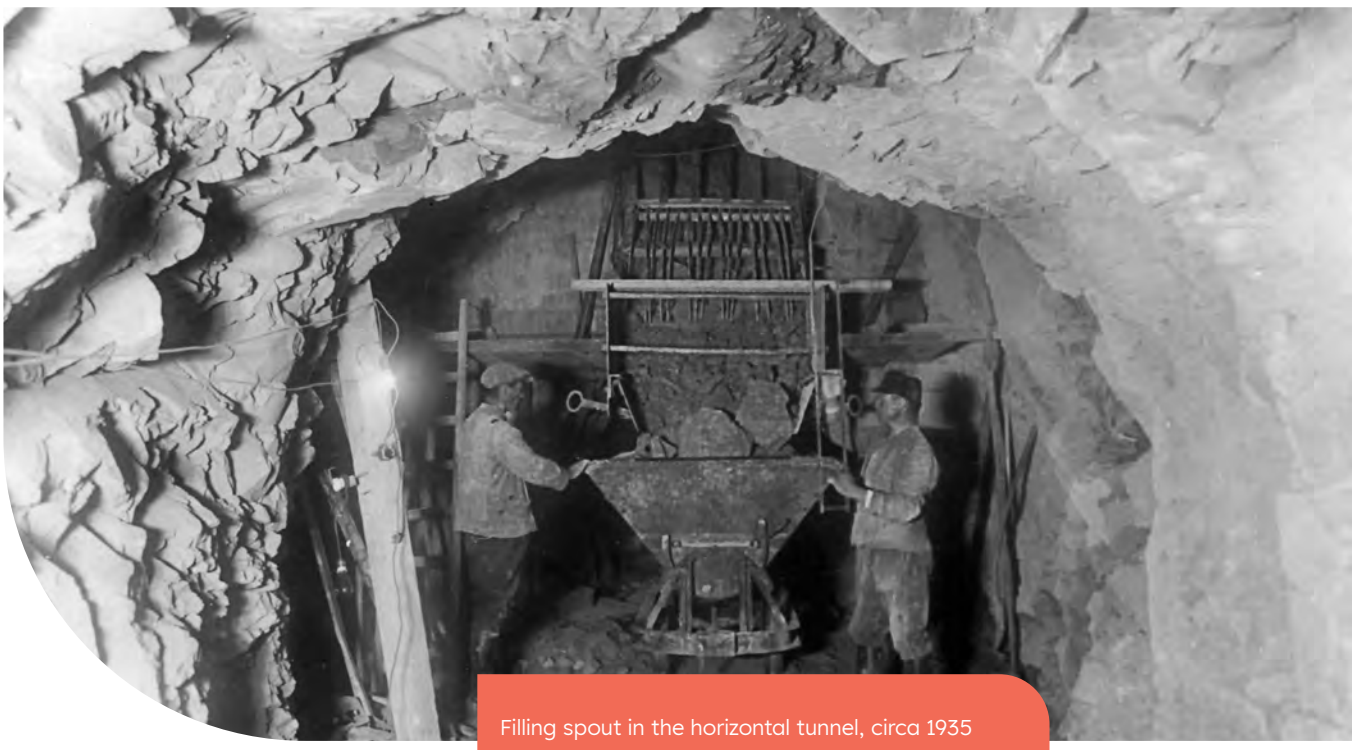
Quotation dated 14 July 1905 from Heidelberger Cementwaaren-Industrie GmbH to Schwetzingen builder's merchant Louis Schwarz for grave surrounds made from synthetic granite

Cooperage, 1900

From the fall operation method to the roll-hole mining method

At the time of the construction of the new plant in Leimen, the quarry located in Rohrbach, which was mined for the Heidelberg plant, was largely exhausted. With the planned establishment of quarries from 1879 onwards, the fall operation method of the Rüdersdorf lime plant was introduced. Horizontal tunnels known as adits were driven into the rock face lengthwise and crosswise until a large cross passage was formed that connected the routes leading into it. The limestone wall then rested only on the pillars, which were further worked and drilled by hand. The drill holes filled with explosives were then electrically detonated, causing the entire wall to collapse. Hundreds of detonations took place, smoke billowed out of the galleries between the pillars, and the wall crashed down with an indescribable roar.

In front of the wall remained a pile of roughly cut stones, which had to be smashed using sledgehammers. Large boulders also to be broken up, which involved drilling into them individually and setting explosive charges. These blasts were very dangerous, as fragments often flew through the air for kilometres. Since loading machines were not yet available, the biggest disadvantage of this extraction method was the strenuous process of manual loading, which required a great many workers.[84]



Filling spout in the horizontal tunnel, circa 1935

Mining in the roll hole, circa 1920

The rapid growth of cement production after the turn of the century soon made it necessary to intensify raw material extraction. In 1909, a new mining method, the so-called “roll-hole” operation, was introduced. The roll-hole method had been copied by a Leimen plant engineer in Pennsylvania, USA, presumably in the Lehigh Valley. Compared with the Rüdersdorf fall operation, the method was a major rationalisation step, as the expensive process of loading the material manually could now be simplified. In the roll-hole operation method, a horizontal tunnel was driven into the mountain, at the end of which a shaft led vertically to the surface. The limestone was quarried by means of blasting, the boreholes for which were drilled using compressed air blasting machines. The stones quarried around the shaft fell through the shaft via so-called filling spouts into the tipping wagons. These were pushed out of the tunnel by hand on tracks and grouped into trains. Over time, the vertical shafts widened to form a funnel, and the rock rolled down its walls. If the walls became too shallow, new roll holes had to be opened up in the immediate vicinity. The ridges that remained between the roll holes had to be removed in the conventional way by hand. Within a very short time, this extraction method was adopted by all Group plants.[85]

Mining in the roll hole, circa 1935

Stone transported by tram

The company management had had its sights set on the high-percentage limestone available in Nußloch for some time. However, lack of transport infrastructure made exploiting it impossible. It was not until construction of the tramway from Heidelberg to Wiesloch began on 1 August 1900 that new transport possibilities opened up.[86]

In anticipation of the tramway's construction, the Portland-Cement-Werke Heidelberg had already begun purchasing land by the Leopoldsberg hill in Nußloch in October 1899.[87]

In the summer of 1901, the single-track tramway between Leimen and Nußloch was completed. Two electric locomotives, each with three goods wagons, were used to transport the stone. The trams travelled at a maximum speed of 22 km/h, and it took half an hour to cover the distance of 5 kilometres. The transport of stone contributed significantly to the

Freight train 81 of the Heidelberg tram in front of the loading tunnel in Nußloch, 1902

Cable car system from Leimen to Nußloch. The workers' houses at Zementwerkstraße, built in 1908, can be seen in the background, 1920.

financing of the Heidelberg-Wiesloch tramway. Records for 1904 show 70,000 tonnes of stone being transported at freight costs of 40,000 marks.[88]

At the instigation of the Portland-Cement-Werke Heidelberg und Mannheim, the stone train operation was suspended from 26 November 1907. Presumably, this is when it became possible to quarry material of sufficient quality more cheaply at the Leimen quarry. Due to the 15-year transport contract with the Heidelberger Straßen- und Bergbahn AG, fixed guaranteed freight rates still had to be paid.[89] From 1910 onwards, the quarrying of raw material had to be increased considerably, as more clinker was transported to the company's other plants. The increase in production required the resumption and intensification of quarrying operations in Nußloch.[90]

Since the Nußloch quarry was located in an old mining area and was criss-crossed by numerous mining tunnels, the roll-hole operation had to be stopped again after a short time. The largely unknown drift courses often caused the roll-hole funnels to collapse and endangered the workers working in them. The abandonment of the roll-hole operation and the associated return to manual loading increased the extraction costs. At 0.306 marks per barrel (1.7 marks per tonne), this cost was three times higher in Nußloch compared with Leimen at 0.096 marks per barrel (0.53 marks per tonne). At that time, however, extraction from Nußloch only accounted for 17% of total production.[91]

After increased operation within the Nußloch quarry from 1910 onwards, the tramway's insufficient transport capacity became a growing problem. In order to secure the raw material base in the longer term, it was decided to build an overhead cable car directly from Nußloch to Leimen, and more land was purchased from the municipality of Nußloch in anticipation. The outbreak of war in 1914 initially brought construction to a halt, however, the cable car system was ready to go into operation by May 1917. In the same year, work began to exploit a new quarry on the recently acquired Stupfelberg hill.[92]

“...keeping out foreign and discordant influences”

After almost a decade, most of the development work had been completed in Leimen. Sales volumes had doubled during this time. However, rising commercial prosperity had not brought comparable wage increases for the workers. Friedrich Schott had so far managed to keep the workers pacified. For more than 30 years, there had been no industrial action by the employees, with the exception of an attempted strike by the ring kiln workers that lasted only a few hours. In patriarchal fashion, Schott had taken care of his employees and demanded obedience in return. Increasing tensions between trade unions and employers at the turn of the century made a new model of “workplace co-determination” necessary. The previous representation of the employees by the health insurance board was generally felt to be inadequate.

Friedrich Schott was a harsh critic of the free trade unions. Only a representative body consisting of the company’s own workers, and one that did not deal with general labour policy issues, would find his favour. His primary goal was “to keep out foreign, discordant influences.”[93]

On 27 November 1905, at the instigation of Friedrich Schott, a notice was displayed at the Leimen factory premises concerning the “formation of a workers’ committee”. At least once a month, the workers were to have “... the opportunity to raise any misunderstandings, wishes, and complaints that may exist.”[94] The workers’ committee met for the first time on 2 December 1905. The surviving minutes of the committee, which existed from 1905 to 1919, give a good insight into the concerns and needs of the employees and the factory management. In the minutes of the first meeting, Friedrich Schott appealed for harmony between the workers and the factory management:

“For more than 30 years, we have always been on the best of terms with our workers ... and we wish that the amicable cooperation of all those working with head and hand in our factory, to whom we owe our present position in the industry, may continue undisturbed in the future for the benefit of all.”[95]

Schott’s patriarchal tendency, which was certainly nothing out of the ordinary at the time, is most evident in the tone of the conversations. Schott’s overview of the entire factory process allowed him to put things into perspective in one case and to grant a request in another. Since the workers’ representatives came from a wide range of departments, a united expression of demands was rare. Nevertheless, the workers’ committee must not be dismissed as a mere token event. Friedrich Schott gave careful consideration to the motions. For him, the committee was all about give and take. He was always generous when it came to improving working conditions or helping in cases of hardship. In return for his concessions, he demanded loyalty from the representatives on the workers’ committee. Thus, they had: “... not only the right but also the duty to immediately bring any agitation affecting their department ... to the attention of the factory management at any time.”[96]

In general, it can be said that the meetings were a forum for workers’ problems, concerns, and complaints. The workers’ committee was often

Locksmith shift, 1910

concerned with issues of physical well-being. On one occasion, it sought to ensure that "there is always [a supply] of all kinds of sausage and cheese in the canteen." Another time, it was stated that the "... sausage from Heidelberg gave rise to complaints."[97] The topic of beer, which obviously had an extremely high priority, was often the subject of negotiations. For example, there were complaints about prices being too high, that barrels were not tapped in time for breaks, and that the beer was often low quality. Another concern of the workers' committee involved determining the amounts from the support fund payable to needy workers and their families.[98]

At the time the new Leimen factory was built, the workers already had the opportunity to eat in a provisional factory canteen. One of the purposes of building the canteen around 1907 was to curb beer consumption by offering food. It was noted that: "The dining hall helps to ensure that beer consumption in the factory is not too high."[99] Even if we cannot quite support the consumption of alcohol during working hours these days, we can still recognise the educational intent of the plant management. However, the main purpose of the canteen was to supply the workers at the cement plant and local residents with inexpensive goods, in order to save them long shopping trips due to the factory's isolated location.

Meat and sausage products, which were sought-after by the workers but otherwise difficult to afford, were available there at a reasonable price. Other foodstuffs, such as herrings and pickled gherkins, were also sold, as were luxuries in the form of cigarettes and chewing tobacco.[100]

In workers' committee negotiations, too, many petitions revolved around the topic of beer, which at that time had a high emotional value among the workers. Banning its consumption could have run a real risk of sparking an uprising, as the 1911 Annual Report suggests:

"The drop in beer consumption in the month of November in the Nussloch quarry is due to the fact that the quarrymen there drank cider to prove that the beer was not good and should be replaced by a type that tasted even better to them. In December 1911 and January 1912, beer consumption in the Nussloch quarry rose again to 62 and 63 litres per person respectively, which corresponds to daily consumption of 2½ litres per person – still quite a lot for the winter."[101]

To counteract alcohol consumption, teetotal plant manager Friedrich Schott offered coffee and homemade soda water free of charge on the factory premises in the summer. The consumption of chewing tobacco with its visually unpleasant side effects probably also caused offence. Schott noted in the aforementioned Annual Report, "... it is heartening that the consumption of non-alcoholic beverages such as lemonade and soda water has increased, while, just as pleasingly, the consumption of chewing tobacco is steadily declining."[102]

“… to elevate them to the propertied class”

In addition to Friedrich Schott’s initiative, the company management had created a catalogue of support measures. One of these welfare institutions was the workers’ support fund, which in 1910 already had an endowment capital of 230,000 marks. The capital came mainly from surpluses from various factory facilities, such as running the canteen, occasional entrance fees, or donations. From the interest on the endowment capital, disabled workers received 12 marks a month and widows of deceased workers 2 to 6 marks, depending on how many children they had and other circumstances. In special cases, one-off benefits of up to 100 marks were granted as well. The company also had its own health insurance fund. This granted workers’ family members free medical treatment as well as medicines and remedies or, in the case of hospital care, it covered 25 to 50% of the

Communal washhouse and bathhouse at Kieslochweg in Leimen, 1900

Rear of the cottages with allotment gardens at Kieslochweg, 1900

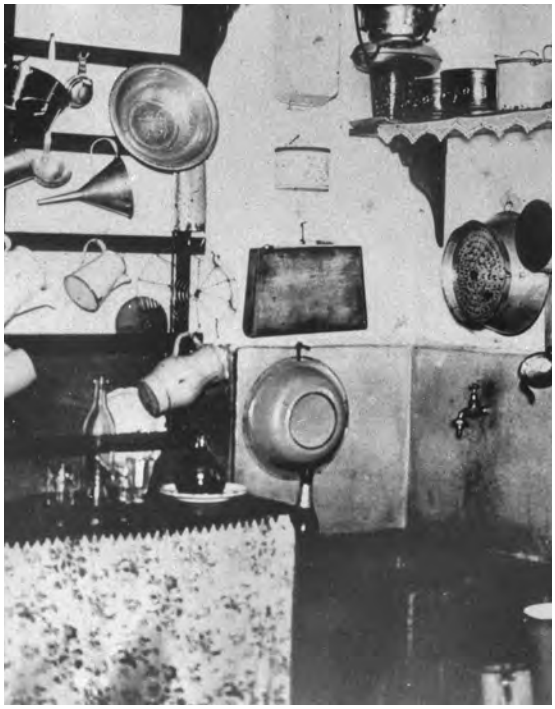
costs. In the event of death, relatives would receive death benefits.[103]

Another instrument was the granting of seniority bonuses. At Easter each year, workers received between 10 and 90 marks, depending on their length of service. From the tenth year onwards, the worker would receive the dividend due on one share, with a minimum payment of 100 marks.

We learn about the significance of the seniority bonuses in a jubilee publication from 1910, according to which the workers used the money to buy land and houses. Such purchases would "... elevate them to the propertied class, thus helping to secure a worry-free old age and making the workers immune to social democratic incitement and bitterness."[104]

The commercial and technical supervisors would receive a bonus at Christmas. Another way of accumulating wealth was through a factory savings bank, which paid 5% interest on deposits. The minimum deposit was 50 pfennigs and the total amount deposited could not exceed 10,000 marks.[105]

Schott was primarily concerned with helping workers to accumulate wealth through system of incentives. However, comprehensive provision by the factory also created dependencies that were likely to strengthen loyalty to the employer. Numerous benefits such as heating fuel (charcoal, waste wood from the cooperage) at cost price, the free use of agricultural land, and favourable loans for the purchase of houses and land served the same purpose.[106]



Kitchen with wood-fired hearth at Kieslochweg in Leimen, 1900

“... for good and deserving workers”

The relocation of the cement plant from Heidelberg to the outskirts of Leimen in 1895 created a sudden demand for housing for many workers. Therefore, when the administration building was constructed, the top two floors were converted into flats. Up to 20 families and individuals occupied the rooms until well into the 1930s.

To mark his 25th anniversary with the company in 1900, Friedrich Schott donated twelve one-storey terraced houses at Kieslochweg (today Peter-Schuhmacher-Straße) for “good and deserving workers,” funded from his private wealth. The flats, which were small but had good sanitary facilities, had extremely low rents. The rental income was invested to earn interest and paid out to the workers when they reached retirement age or to their families in the event of their death. All the houses were built by the workers themselves, entirely from concrete blocks and concrete bricks they made themselves. The foundation conditions bore the patriarchal features typical of Friedrich Schott. By the end of 1909, the amounts thus collected for the owners of the houses totalled 14,888 marks, while over 18,000 marks were repaid to former tenants or their relatives.[107]

In 1903, the Supervisory Board and Managing Board decided to establish a construction company with a share capital of 150,000 marks for the purpose of building more workers’ houses. This company built six larger workers’ houses containing 30 individual flats. In 1908, more terraced houses were built at Zementwerkstraße, and in the 1930s and 1950s, several housing estates were constructed.[108]

The cottages at Kieslochweg in Leimen were built entirely of concrete by the workers. Cellar walls were constructed from tamped concrete using prefabricated board walls set against the earth. The ceilings were poured between interposed steel girders, and wooden strips embedded in the concrete were used to fix pinewood floors. The exterior walls were made of coloured moulded bricks. Window frames, door frames, cornices, and roof tiles were also produced in the company´s own concrete products factory. Each cottage had a front garden facing the street and a back garden with fruit trees and small pens for animals. A laundry room with a well, oven, and bathroom, as well as a drying area were available for communal use in a building to the rear, 1900.

Terraced houses at Zementwerkstraße, 1910

Welfare facilities

The Leimen cement plant not only played a pioneering role in the technical and economic production conditions, but also set new standards in improving the working and living conditions of the employees. Friedrich Schott's great passion was competitive sport. He often played a prominent role in Heidelberg and Leimen by making generous material and financial donations to local clubs.[109]

As early as 1906, he had opened an outdoor swimming pool in the so-called "Kiesloch", the Heidelberger Cementwaaren Industrie's gravel pit. Under the patronage of Schott, the first National Youth Swimming Festival also took place at the pool in 1921. He had a 50 m lane made of wooden planks built into the gravel pit specifically for this event.[110]

In 1907, an indoor swimming pool in the art-nouveau style was built on the south side of the factory complex, where the gardens of the factory's supervisors and workers were located. The 8 m × 16 m pool was heated with waste heat from the kilns.

The use of the bathing facilities was free for the employees of the factory and their relatives.

Indoor swimming pool. The 600 m² building is made of imitation limestone and reddish-yellow facing bricks. The pool attendant was housed in the annex with a balcony. The adjacent staircase tower led to the bath, 1983.

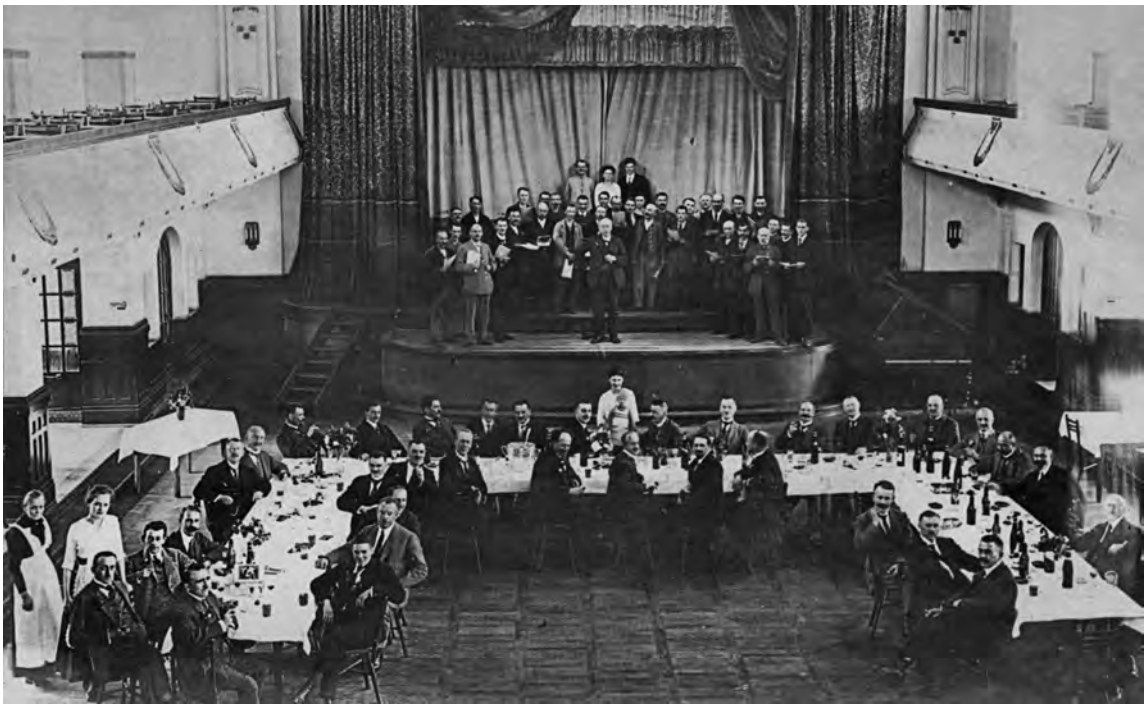
The interior of the indoor swimming pool shortly before it closed in 1973. The building was refurbished in 1983 and has since served as the plant canteen.

The inhabitants of Leimen were also allowed to use the bathing facilities on certain days of the week. All schoolchildren had free access, while adults had to buy a bathing ticket at the modest price of 10 pfennigs. This income went to the workers' support fund.[111]

The Annual Report for 1910 shows a considerable user frequency of 15,567 people for the relatively small pool. In 1911, the number of visitors soared to 21,769.[112] The last and most important welfare facility to be built at the Leimen plant was a large workers' festival hall, completed in 1909. The construction costs were partly covered by a donation of 20,000 marks from a member of the Managing Board. The hall was intended to serve the employees of the Leimen cement plant and their families primarily as a meeting place and a venue for further education.

In addition to a large assembly hall, there was a library with a reading room, a billiard room, a kindergarten with a trained teacher, and a modern kitchen. The latter also served as a training kitchen for the employees' daughters.[113]

The assembly hall had a well-equipped stage with a projection machine and cinematograph. There was room for up to 2,000 people. Lectures, theatre performances, and other entertainment took place almost every Sunday. The traditional workers' celebration was held



The festival hall's auditorium with stage, circa 1920

Festival hall from the south-west, circa 1935

every autumn and was accompanied by music from the workers' choral society. The motto, which was also written above the entrance, was:

"Daytime Work – Evening Guests,
Hard Week – Happy Festivities."

Friedrich Schott had two clasped hands, a cast of his hand and that of the workers' leader of the time, Emil Rüdiger, mounted above the door to the festival hall as a symbol of unity between the workers and the factory management.[114]

Together with the various factory clubs, the shooting club, and the factory fire brigade, the factory social institutions formed a small community. Workers and supervisors were involved in these both during working hours and in their free time. The factory's isolated location on the outskirts of the town of Leimen had fostered the formation of a separate identity. However, the semi-public factory leisure facilities also brought about increasing integration of the cement plant into town life.

South entrance to the festival hall, circa 1935

Group of singers from the community choir in front of the south entrance to the festival hall, circa 1914

Group plants before the First World War

The welfare facilities at the Leimen location were also a benchmark for the other affiliated plants. Workers' houses and a supervisors' residence were also built in Nürtingen. In Lochhausen, Offenbach, and Diedesheim-Neckarelz, company housing, canteens, bathing facilities, and shops were also constructed in the following years. In Diedesheim, a so-called workers' barracks was built for single workers, where they could stay for 10 to 15 pfennigs per night. The daily wage of a worker was about 3 marks. The canteen provided basic food at cost price: lunch 40 pf, sausage and bread 12 pf, cheese and bread 10 pf, coffee and bread 7 pf, ½ litre of beer 10 pf.[115]

After the takeover of the Diedesheim-Neckarelz plant by Portland-Cement-Werke Heidelberg und Mannheim, the Portland-Cement-Werk Diedesheim-Neckarelz Workers' Association was founded on 11 October 1905, following Leimen's example. It, too, had a choir. According to its statutes, the association would foster sociability and steer clear of political matters.[116]

The villa of director Sigmund Wagner, built in 1901 at Hambergweg/Obere Milbe in Diedesheim. The factory owned a house with flats for the master craftsmen and several workers' houses containing three-room flats, circa 1920.

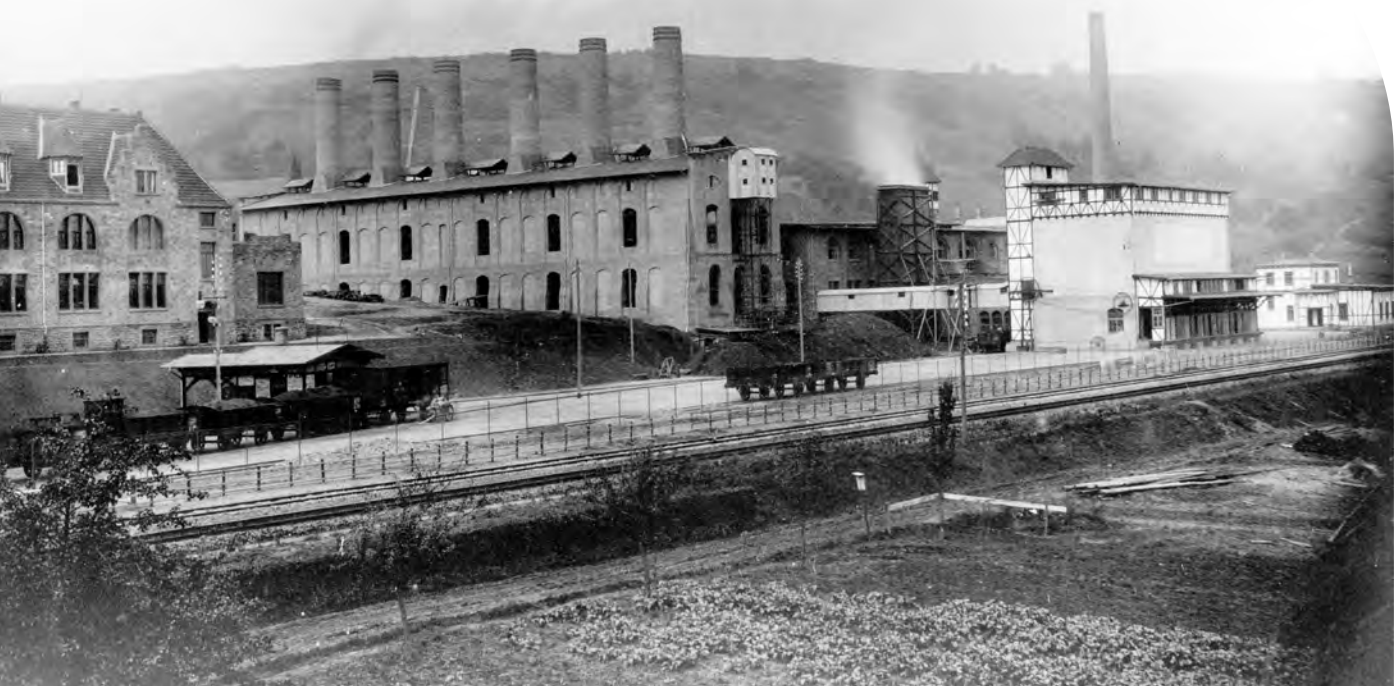
After the closure of the Mannheimer Portland-Cement-Fabrik in 1902, the flag of the local workers' association was redesigned for the Leimen community association in 1908. The Heidelberg Lion was added.

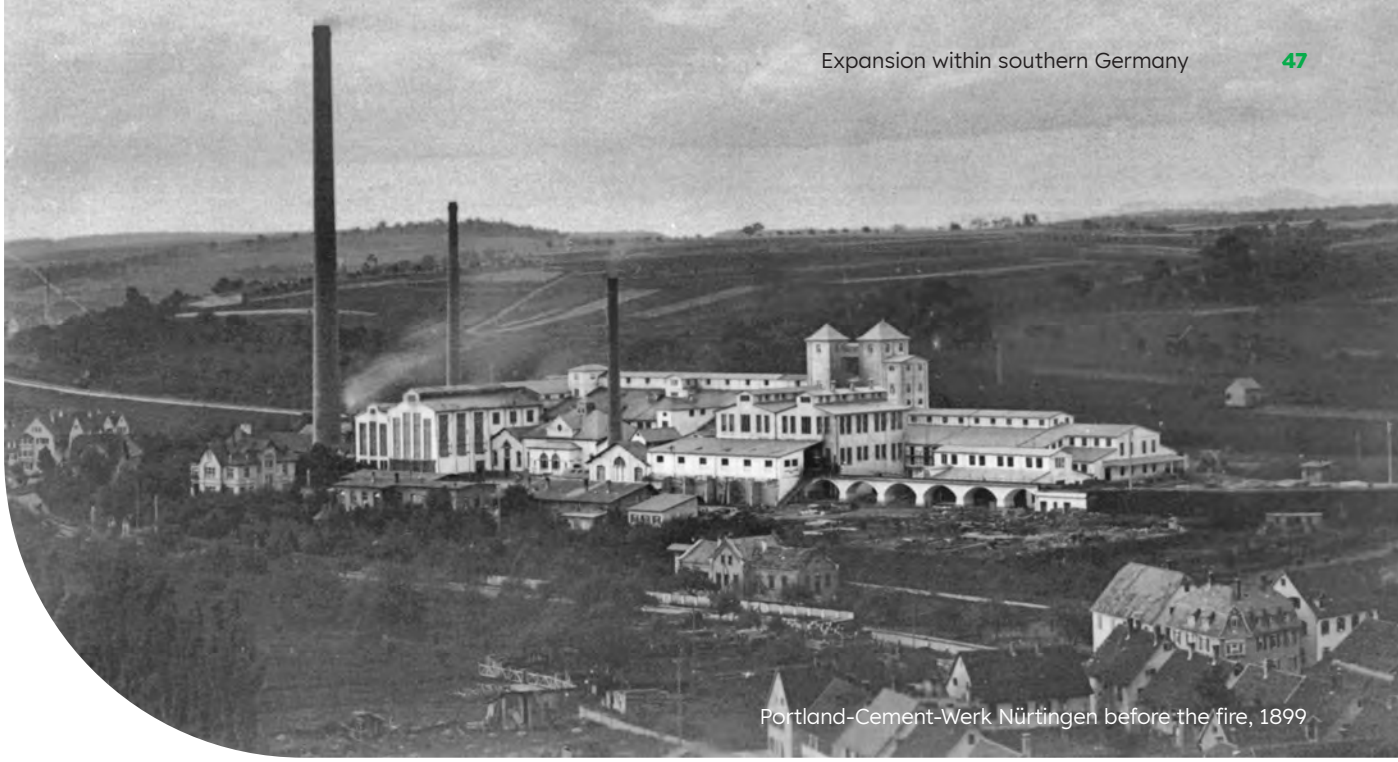
Barrel label, circa 1900

Supporting such factory associations was entirely in the interests of Friedrich Schott and Wilhelm Merz. The latter had already supported a similar workers' association in the former Mannheimer Portland-Cement-Fabrik. There was a lively interaction between the individual associations, which saw them exchanging songbooks, trophies, and flags even after they disbanded.[117]

The Portland-Cement-Werk Diedesheim-Neckarelz Actien-Gesellschaft, acquired through an share swap in June 1904, is more accurately to be viewed as a combination of several acquisitions made during this period. These included the Portland cement factories in Budenheim, 1904, the Offenbach Portland cement factory, 1906, and the Ingelheim Portland cement factory, 1907. The plant in Diedesheim was initially destined to be shut down after operating at a loss for six continuous years.[118] After the consolidation of the South German Cement Sales Office, sales volumes generally stabilised. Encouraged by this, the Portland-Cement-Werke Heidelberg und Mannheim changed their position and announced at their annual general meeting on 11 March 1905: "We have abandoned our intention to shut down the plant permanently and to distribute the production of this plant among our other plants in order to use of their capacity more fully."[119]

Portland-Cementwerk Diedesheim-Neckarelz, as designed by the well-known architect Hermann Billing from Karlsruhe. About 12 railway wagons were loaded daily, 1904.

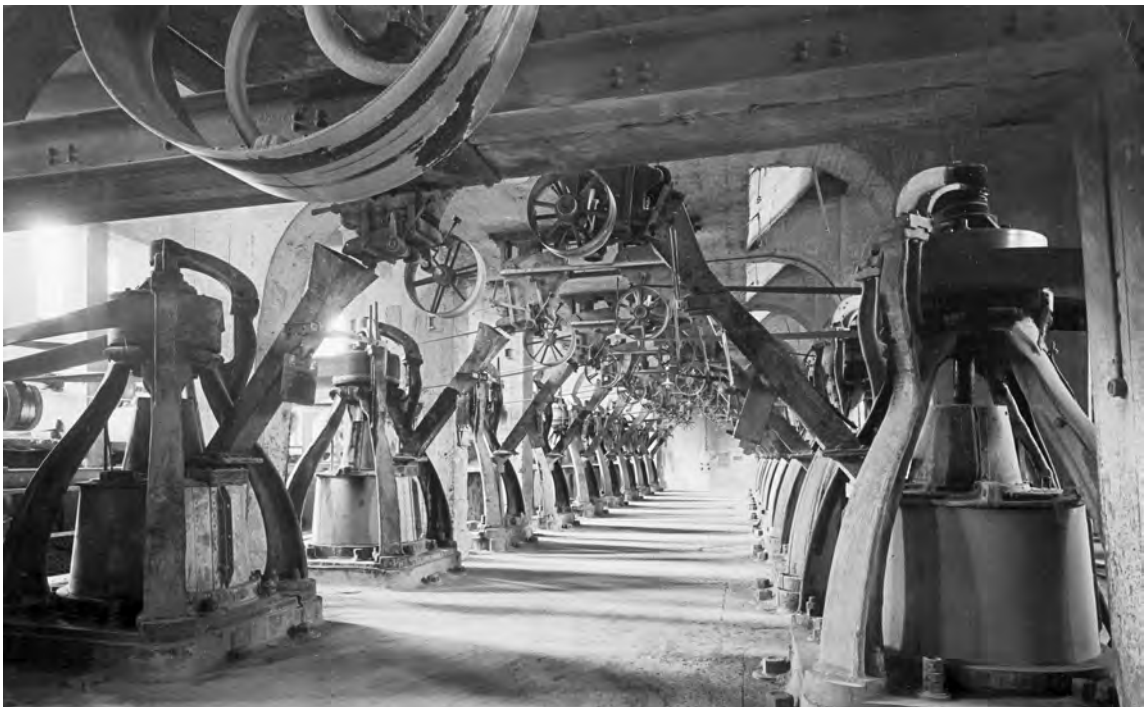




Portland-Cement-Werk Nürtingen before the fire, 1899

From 1905 onwards, the Diedesheim factory experienced a noticeable upward trend. In the following year, it already became possible to pay out a dividend of 8% again for the first time. To increase production, a Schneider kiln was built in 1906 and another in 1907, reaching a total of six by 1910. The conversion of the mining operations to the roll-hole method also significantly reduced the plant's extraction costs. In 1909, the company produced 250,000 barrels (45,000 tonnes) of Portland cement and white lime.[120]

The Nürtingen plant had been acquired in 1899 due to its location in the highly industrial Neckar valley and its proximity to Stuttgart. As the existing mechanical equipment was not suitable, major rebuilding was required. After the Mannheim factory was closed, some of the machines that became available were used to expand the cement mill and machine house. The Griffin mills developed in Leimen were also soon installed. A major fire in May 1912 caused a setback, severely damaging the plant, which was largely constructed from wood.[121] After it was reconstructed in reinforced concrete and fitted with the latest technical equipment, production could resume at the beginning of 1914. The Offenbach and Weisenau plants were also extensively renovated after 1907, and rotary kilns were installed.[122]



Transmission-driven Griffin mills, after reconstruction, circa 1930

The First World War

From 1905, after the establishment of the South German Cement Sales Office, there was a noticeable improvement in domestic sales figures. Until 1911, sales volumes in the Group plants rose continuously, and they struggled to meet the high demand.[123] From 1912 onwards, after years of great economic fluctuations, demand from abroad suddenly collapsed, causing sales volumes in Leimen to drop by 35% and in Weisenau by as much as 48.5%. A considerable share of the German cement industry's sales volumes were exported worldwide. Important buildings overseas in Manhattan (New York), on the Avenida Central in Rio de Janeiro, the military academy in West Point, and the Fidelity Life Mutual Benefit Association in Philadelphia are just a few examples of buildings made using Heidelberg-Mannheim cement during this era.

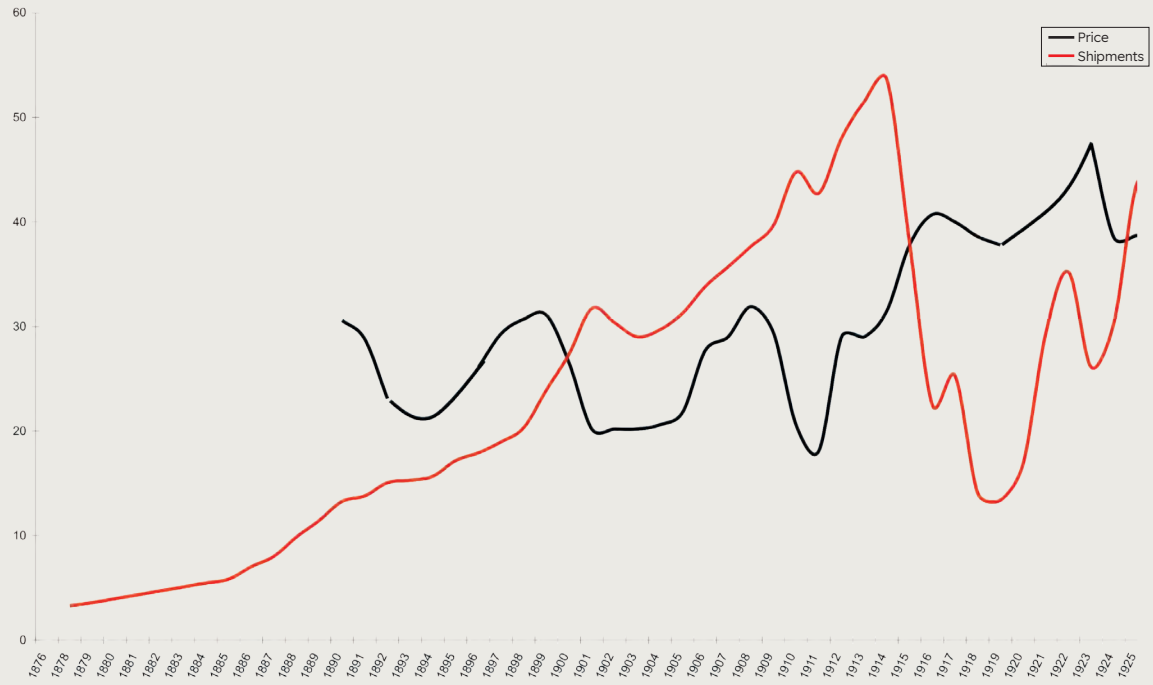
Chade power station in Buenos Aires, built using Leimen cement before the First World War, 1928

Barrel label, circa 1905

Wilhelm Merz, member of the Managing Board, retired in 1914. Privy Councillor of Commerce Friedrich Schott (Dr.-Ing. e.h) and Carl Leonhard continued to manage the company.

When the First World War broke out on 1 August 1914, German cement exports, which had still amounted to over 1.1 million tonnes in 1913, came to a standstill.[124] A planned investment in a cement company in Brazil did not materialise due to the outbreak of war. In 1913, Friedrich Schott's brother, engineer Otto Schott (*31/12/1869 Seesen †15/05/1937), had made a research trip to South America especially for this purpose.[125]

Within a very short time, all construction activity in the German Empire came to a complete standstill due to the lack of demand, but also due to the conscription of workers and bottlenecks on the railway network. Most of the foreign workers also left the country, which further aggravated the manpower situation.[126] In addition, there was a shortage of important operating materials and fuel, which meant that the cement sales volumes of the Portland-Cement-Werke Heidelberg und Mannheim had already fallen to 43% of the 1913 figure by 1915.[127]



Development of cement prices (black) and shipments (red) in the years 1876 to 1925 in Germany

Blaubeuren employees who took part in the First World War in 1918. Presumably Dr Georg Spohn in the background

Grenade production in the machine factory at the Leimen plant. A camp for prisoners of war was located on the site of the concrete products factory. The missing kiln operators were mainly replaced by Russians, 1915.

During the First World War the festival hall in Leimen served as a military hospital, circa 1915.

The drastic changes in the cement market immediately led to the shutdown of the Portland cement plant in Budenheim on the Rhine. Since the cement industry was not counted among the industries important to the war effort, it was particularly affected by coal rationing. As a result, production in the smaller plants was stopped as early as 1915 in order to be able to maintain at least partial operations in the two large plants, Leimen and Weisenau.

At the Diedesheim cement plant, extensive firing tests on the six Schneider kilns had started shortly before the beginning of the First World War, with the aim of increasing production capacity to 300,000 barrels (51,000 tonnes). By the end of the kiln trials in 1915, the plant had reached its highest production capacity, at a time when sales volumes were falling sharply.[128]

The new plant in Burglengenfeld, half of which belonged to the Group, also had to cease operations just one day after the start of the war and after only two months of production. The reason was that the site was not yet included in the coal management plan of the Bavarian Raw Materials Management Office. Due to the transport restrictions caused by the mobilisation, the accumulated stocks could not be sold and, until May 1915 the company had to limit itself to meeting the low demand, which amounted to just 4,760 tonnes.[129]

In the following years, the plant was often unable to operate and ran at a loss. One major factor in this situation was the guaranteed sum that had to be paid to the Bayerische Überland-Centrale for a minimum purchase of electricity. In order to reduce the plant's loss in 1916, it began grinding by-products towards the end of 1915. From October 1915 to the end of May 1921, fertiliser and fodder were produced using the existing grinding facilities. In addition, due to the uncertain sales situation, it was decided to make the quota of 47,000 tonnes available to the South German Cement Sales Office for 1916 and for the following years in return for appropriate remuneration.[130]

In the first weeks of the war, the Portland-Cementfabrik Blaubeuren was still busy with a large order for the construction of the Ulm fortress. During the course of 1914, however, sales volumes quickly dropped to 25,000 tonnes, and soon only one kiln was still in operation.

The Spohn brothers' cement factory in particular benefited from the measures introduced by the government. While a loss of 270,000 marks was still recorded in 1915/16, a profit of 580,000 marks was already achieved again in 1917. The construction of fortifications in 1917, which suddenly increased demand and resulted in sales volumes of 42,000 tonnes, also played a significant role in this development. Shipments were mainly made from existing stocks, as production had come to a standstill due to a shortage of coal. Since the Italian workers who had operated the ring kilns went back home and the German workers were not up to the work, the idea presented itself to produce lime fertiliser, with a quantity of 19,000 tonnes produced in 1917.[131]

Fritz Brans, director of the Süddeutsche Cement-Verkaufsstelle GmbH, from 1916 a member of the Managing Board of the Portland-Cement-Werke Heidelberg und Mannheim, circa 1910

Dr Ehrhart Schott, 1928

Amidst the turmoil of the war, on 1 April 1916 the supervisory board appointed Privy Councillor of Commerce Friedrich Schott (Dr.-Ing. e.h.) as Managing Director and Ehrhart Schott (son of Friedrich Schott), Leimen, Adolf Schott (brother of Friedrich Schott), Nürtingen, Carl Schindler, Weisenau, and Fritz Brans, former member of the Managing Board of the South German Cement Sales Office in Heidelberg, as members of the Managing Board. Only Fritz Brans and Friedrich Schott worked in the head office in Heidelberg; the remaining members of the Managing Board largely acted as plant managers.[132]

Not wanting to endanger the very survival of the entire German cement industry, the German Federal Council issued a decree on 29 June 1916 that prohibited the construction of new cement factories. In the so-called Hindenburg Programme, the forced management of limited coal supplies was intended to help remedy the catastrophic supply situation for the industry in the wartime winter of 1916/17. The short-term increase in production in 1917 indicated a temporary success of these measures. The difficult wartime conditions encouraged a process of consolidation. As early as 1911, the Centralstelle zur Förderung der deutschen Portland-Cement-Industrie (Central Office for the Promotion of the German Portland Cement Industry) was established on the initiative of Friedrich Schott. With the inclusion of the slag cement plants, the Deutsche Zement-Bund (German Cement Association) emerged from this body in 1917 as an interest group representing the entire German cement industry.[133] The syndicates that had emerged at the beginning of the century in the struggle for prices and sales territories developed into compulsory state syndicates between 1916 and 1917 as a result of the war-related regulations. With the help of these compulsory syndicates, it was possible to increase the cement price from an initial 38 marks per tonne to 58 (sales to the state) to 65 marks (sales to private buyers) per tonne in 1917, despite the collapsed cement market. By the end of the war, the German Cement Association was able to push through another 25-mark increase.[134]

By 1918, sales volumes had fallen to 37% of the 1913 levels. Of the 1,511 employees called up for military service, 200 did not return. Despite the difficult financial situation, the bereaved families received help from a support fund.[135]

Women on the home front

Female worker by the entrance to the repair shop at the Leimen plant during the First World War

The labour shortage caused by the First World War led to an increased employment of women and teenage workers. The emergency law, in force from 4 August 1914 to September 1918, allowed extended working hours for female workers over the age of 18 and male workers over the age of 16.[136] In February 1918, the Leimen plant employed 11 under-18s and 32 female workers.[137]

In the cement plants, women were usually employed to sort sacks and push carts, while older female workers also operated the kilns. Upon request, the trade offices also allowed Sunday work for female workers over 16 years of age. However, the ban on female workers using machines remained. For example, the Mosbach Trade Inspectorate clarified on 12 July 1918:

Poorly paid work such as sewing filter sacks was exclusively women's work. Mrs Kuen, a seamstress in Kiefersfelden, sewed 2,930 of them a year, 1965.

"Employment of female workers. Female workers under the age of 16 may only be employed in the packing house, sack hall, in the yard, and as assistant kiln operators. These workers shall be forbidden from entering the rooms where machines are set up by a notice from the factory management under penalty of immediate dismissal if the regulation is not complied with."[138]

In the new factory in Burglengenfeld, too, 21 women were employed to maintain the production of substitute materials. The pay was extremely poor: they received only about half the wages of the men. One of the few documented cases of women rebelling against this is found in a letter from the Burglengenfeld district office in 1918:

"On 28 January, at the instigation of Himmelhuber Fanny, wife of the well-known strike leader Himmelhuber, who had joined the factory a few days earlier, all the women workers petitioned for an increase in the hourly wage from 35 to 40 pfennigs. As they could not be granted the increase immediately due to the absence of the factory manager, they went on strike despite a warning. The female workers who returned to work in the afternoon were admitted, the remaining 12 were locked out."[139]

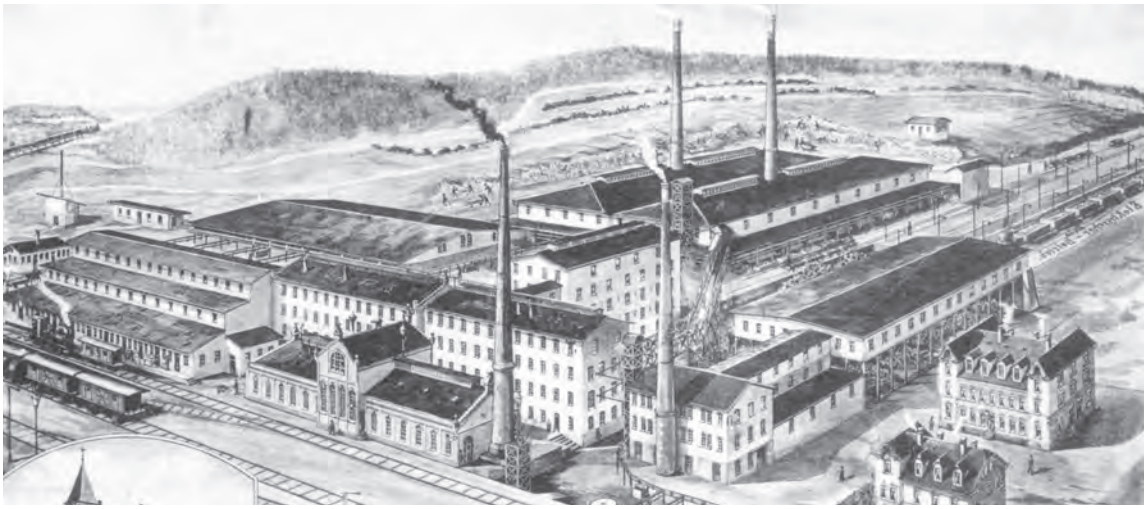
Portland-Cementwerke Heidelberg-Mannheim-Stuttgart AG

Company trademark, 1918

Even during the war, Friedrich Schott had repeatedly offered close cooperation to Stuttgarter Immobilien- und Baugeschäft AG. Both companies had shares in the Spohn brothers' Blaubeuren cement plant and in the newly built Burglengenfeld cement plant. The Stuttgart company had already merged with the Cementwerke Gebr. Leube in Ulm in 1883. It acquired majority shares in the Portland-Cement-Werk Marienstein in 1903[140] and in the Süddeutsches Portland-Cement-Werk Münsingen in 1907. As with Heidelberg-Mannheim, this marked the end of its expansion prior to the First World War, mainly as a result of economic fluctuations at that time.

The poor prospects of the cement market, which had slumped by another 74% in 1918, finally tipped the scales in favour of a further alignment of the two companies. On 24 August 1918, Portland Cement-Werke Heidelberg und Mannheim AG merged with Stuttgarter Immobilien- und Baugeschäft AG. The new company operated under the name Portland-Cementwerke Heidelberg-Mannheim-Stuttgart AG until 1937.

However, it was not easy for the Stuttgart-based company to give up its headquarters in Württemberg. At the extraordinary general meeting on 24 September 1918, the board of



Schelklingen cement plant of Stuttgarter Immobilien- und Baugeschäft AG. Drawing by Chr. Rudolph, 1901

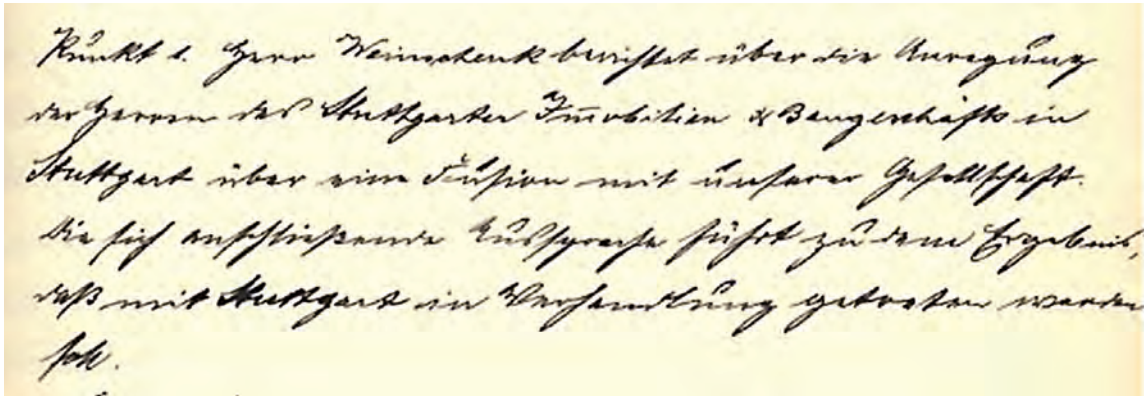
the Stuttgarter Immobilien- und Baugeschäft AG justified the decision to merge, which had been under consideration for some time:

"For years now, at occasional meetings of our Managing Board with the members of the Managing Board of Portland-Cement-Werke Heidelberg und Mannheim in Heidelberg, the idea of a closer connection between our two companies than already offered by the cement syndicate has been discussed. Only the reluctance to give up the independence of our company and to relocate the headquarters of an old, flourishing Württemberg company to Baden has held the Managing Board of our company back from following up on the suggestions."[141]

The Stuttgart company added cement plants in Allmendingen, Ehingen, Marienstein, Münsingen, and Schelklingen, as well as two brickworks in Cannstatt, into the new company. Heidelberg-Mannheim-Stuttgart had thus become the leading cement manufacturer in southern Germany. The Managing Board of the new company in Heidelberg was expanded to include the Stuttgart Managing Director Woldemar Schrader and Councillor of Commerce Paul Wigand from Schelklingen. The shareholders of the Stuttgart company received newly issued shares in Heidelberg-Mannheim-Stuttgart in exchange for their stocks. The share capital was therefore increased by 5.6 million marks to 20.6 million marks.[142]


Portland-Cementwerke Heidelberg-Mannheim-Stuttgart Aktiengesellschaft
in
HEIDELBERG.
1000 MARK
AKTIE
über
EINTAUSEND MARK.
Der Inhaber dieser Aktie ist nach Verhältnis der dafür einbezahlten
Eintausend Mark
an dem Vermögen der Aktiengesellschaft statutengemäß beteiligt.
Heidelberg, den 14ten Februar 1919.
Für den Aufsichtsrat:
Für den Vorstand:
F. Schott
Eingetragen
Der Kontrollbeamte:
Fol. des Aktienbuches.
AKTIENGESELLSCHAFT in HEIDELBERG

1,000-mark share of the merged company dated 14/02/1919



Extract from the minutes of the Supervisory Board meeting of Portland-Cement-Werke Heidelberg und Mannheim from 14/06/1918

Working conditions and earnings

The November Revolution of 1918 led to the abdication of the Kaiser and the abolition of the monarchy. With the introduction of a democratic parliamentary republic in January 1919, political upheavals took place that also had a profound impact on labour relations.

Under the influence of the workers' councils, one of the earliest demands of the workers' movement was realised immediately after the abdication of the Kaiser. On 23 November 1918, the decree was issued on the introduction of the eight-hour day for industrial workers. This hit the unprepared cement industry hard, as it reduced productivity to half of what it had been in 1913, prior to the war. Since the cement industry had been producing with continuously burning kilns in the 1880s, work had to be done in shifts.

The entire production operation was coordinated with the burning process, which ran day and night. Decades of technical developments had led to the construction of machinery that made it possible to supply or discharge materials to and from the kilns continuously in two shifts amounting to 120 hours per week. Before 1914, a ten-hour working day plus two hours of rest was common. Daily work began at six in the morning and ended at six in the evening. It was interrupted by a half-hour break in the morning and again in the afternoon and a longer 75-minute lunch break. In fact, the workers had to be present in the factory for more than twelve hours. However, working hours could vary seasonally, especially in the quarry operations. In the ring kiln operations, with day and night work, the shift lasted twelve hours and changed at twelve o'clock each day. There were 300 working days in a year and no entitlement to holidays.[143]


Arbeits-Ordnung

für die

Portlandcementfabrik Blaubeuren

Gebrüder Spohn.

Workplace rules for the Spohn brothers' Portland-Cementfabrik Blaubeuren from 1892

Manual loading in the Gerhausen quarry, circa 1920

Three-shift operation initially increased the weekly working time to 144 hours, without being able to increase production with the existing equipment. In total, 20% of the labour output could not be converted into an increase in production. However, the drastic reduction in productivity had other important causes. Shortages in the economy during the time of the First World War, with insufficient lubricants, substitute materials, and coal management, as well as insufficient maintenance due to a lack of personnel had led to the plants falling into a desperate condition.[144]

The sharp decline in productivity can be seen particularly clearly in the example of the Spohn brothers' cement factory. From 1917 to 1923, production fell by 35% and only returned to its 1917 level in 1931.[145]

Wages were agreed independently between the employer and the worker. Lost working hours due to accidents, repairs, and factory shutdowns were not paid.

"If accidents or breakdowns of machinery or other repairs or alterations to buildings, machinery, steam boilers, steam and water pipes, and similar circumstances cause the factory or individual departments to be shut down, the workers are not entitled to compensation for the lost working time."[146]

Violations of the workplace regulations were punishable by a fine of up to half of the daily wage. The amounts were withheld from the fortnightly wage payment, paid out in cash in wage packets.[147] Subsequent regulations after 1923 also laid down the same conditions for female workers. Numerous provisions and punitive measures from earlier workplace regulations were dropped and the overall tone is noticeably more liberal.

Only one passage remained unchanged:[148]

"Anyone who does not come to work on time has no right to employment on that day."[149]

Social problems and workforce unrest

The political upheavals that had led to the strengthening of social democracy also raised the self-confidence of the workers and the trade unions. Starting from incomes that were close to the subsistence level, wage increases with significant real wage gains were achieved within a short period of time. Except for the years 1894 and 1902, wage development had followed a uniform upward trend, starting from a low level. Nevertheless, as a result of rationalisation measures, the wage rate per tonne of cement in the German cement industry fell from 5.56 marks in 1886 to 4.61 marks in 1913, reaching a low before the war. In the post-war period, it was no longer possible to reduce the wage rate per tonne of cement, despite all the technical innovations.[150]

In February 1919, shipments in Germany had reached an all-time low and had fallen to 25% of pre-war production levels. Many workers had to be kept busy with emergency work in the factories. In 1916, Friedrich Schott's son Ehrhart had taken over factory management in Leimen. He tried to keep the business going using unconventional measures. To create larger storage capacities in the clinker stores, he had the inner silo roofs taken down and the cement

Workers from Portland-Cementfabrik Blaubeuren in front of the houses in the "cement village," circa 1920

clinker stored up to the outer roof. To keep the raw mill operating to some extent, the two-shift operation in the quarry had to be reduced to one shift. Forty-five workers were affected, fourteen were dismissed, and further lay-offs were planned for March.[151] Even before the war, the Social Democrats (SPD) and Friedrich Schott, who was close to the German People's Party (Deutsche Volkspartei, DVP), had been engaged in a battle of words in connection with the right of workers to organise, known as the right of association:

"... We demand that, at long last, the right of association granted by law should no longer be withheld from the workers. Many workers had to leave Leimen because they could not find work in the surrounding area. Out of humanity alone, the Schott family should refrain from such illegal behaviour. Just recently, Dr [Ehrhart] Schott junior again dismissed ten men from the packing house because they organised themselves to resist a wage reduction.

The fact that these blows hit home showed in the embarrassment with which Mr [Friedrich] Schott replied [saying that] he had nothing at all against the right of association, but whoever did not conform in his company would be fired. (Mr Schott dislikes all social democratic and free trade union organisers)."[152]

This example makes clear the tensions that existed between organised labour and Messrs Schott, and with employers in general. The degree to which the workforce of the cement industry was organised was traditionally low, and strikes were the exception rather than the rule. Why this was the case has yet to be investigated in detail.

An unusual event put a lasting strain on the relationship between the workers and the management. During the morning of 8 February 1919, workers at the Fuchs wagon factory in Rohrbach near Leimen had stopped work and forced the reinstatement of a master craftsman. At around 3 p.m., 700 workers marched with a red flag in front of the Leimen factory gates and demanded that director Dr Ehrhart Schott reverse dismissals. Schott explained that he wanted to negotiate with the elected workers' committee and the quarry workers concerned, but not with the Fuchs workers. The quarry workers were told that their dismissals could be withdrawn, but that others would then have to be dismissed. What followed dominated local press coverage for days in full-page reports:

"After the quarry workers left, the workers from the Fuchs wagon factory threatened to demolish everything if they were not let in. Director [Ehrhart] Schott said that three men from the other company's workforce should

Achtung! Achtung!

Streik in „Wetterau"

An die Bevölkerung!

Der Kampf der Zementarbeiter in Lengfurt dauert nun 5 Wochen. Die Direktion hat bis jetzt alle Einigungsversuche soweit sie von den Arbeiterorganisationen selbst, sowie vom bayer. Sozialministerium eingeleitet waren, in schroffer Weise abgelehnt. Sie glaubt, daß sie durch diese Behandlungsart die heiligsten Rechte der Arbeiter schafft. (Koalitionsfreiheit, auskömmliche Lohn- und annehmbare Arbeitsbedingungen) auf ein Niveau zurückführen kann, wie es vor einem Jahrzehnt einmal bei ihr üblich war. Nach dem durch das ablehnende Verhalten der Direktion bis jetzt keine Einigung erzielt werden konnte, versucht sie durch öffentlichen Anschlag in Form eines Lohnangebotes, das weit unter der Lohnhöhe der übrigen Zementwerke zurückbleibt und die bestehenden Teuerungsverhältnissen nicht berücksichtigt, die Arbeiterschaft in den aufgezwungenen Kampf mürbe zu machen und Streikbrecher zu gewinnen.

Die unterzeichnete Organisationen und die Streikleitung richten hiermit an die gesamte Bevölkerung, speziell an die Arbeiterschaft die Aufforderung, sich in keiner Weise von der Direktion auf den Leim locken zu lassen und nach wie vor den Betrieb zu meiden. Nähere Aufklärung über die Einigungsversuche, sowie über das rigorose Verhalten der Firma, wird in den ersten Tagen in öffentlichen Versammlungen gegeben; die Arbeiterschaft des Zementwerkes „Wetterau" steht nach wie vor, um ihre berechtigten Forderungen im Kampf.

Unterstützt Eure Arbeitskollegen in ihrem Existenz-Kampf, meidet den Betrieb und werdet nicht zum Verräter an Euren Arbeitsbrüdern und damit an Eurer eigenen Sache.

Die Streikleitung.

Verband der Fabrikarbeiter Deutschlands. Deutscher Metallarbeiter-Verband. Zentralverband christl. Fabrik- und Transportarbeiter.

Leaflet dated 11/04/1922 on the call to strike as part of nationwide industrial action by cement workers

Arbeiter des Zementwerks!

Man sandte mir den „Pfälzer Boten" mit einem Artikel, unterschrieben H. Ammann und der Überschrift:

„Was manche unter Volksgemeinschaft verstehen."

(Hungergroschenaufbesserungen im Königreich Schott.)

Der Artikel beschäftigt sich mit der kürzlichen Feier des Vaterländischen Arbeitervereins in der Festhalle Leimen.

Nach den nun allmählich genügend bekannten bösen Schlagworten „Scharfmacherei", „Unternehmer-Willkür", „Machtwillen" usw. heißt es dann wörtlich:

„Dieser Werksverein, auf den allgewaltigen Geheimrat Schott-Brehl gegründet und zusammengehalten, weil ohne diese Mitgliedschaft Brot und Arbeit verwirkt ist, hielt nun am 15. November Jahresweihefest in der von Geheimrat Schott gütigst zur Verfügung gestellten Festhalle ab. Diese Festhalle hat man 1. Jt. trotz der ständigen Falschhilfe, die angeblich der Betrieb erfordert, und wodurch die Bezahlung ausreichender Löhne einfach unmöglich gemacht sein soll, für den gelben Verein gebaut."

Glaubt jemand, daß Herrn Ammann nicht ganz genau bekannt ist, daß unserem Vaterländischen Arbeiter-Verein von den über 1100 im Werk beschäftigten Arbeitern noch nicht ganz 200 angehören und daß auf die andern nicht der geringste Zwang zum Austritt ausgeübt wird?

Hat in diesem Falle Herr Ammann nicht bewußt die Unwahrheit gesagt? Pfui, Herr Ammann!

Ist diese Festhalle nicht lange vor Kriegsausbruch gebaut, als der Vaterländische Arbeiterverein noch gar nicht bestand?

Arbeiter! Wielange wollt Ihr Euch noch von Leuten bevormunden lassen, die so mit der Wahrheit umgehen?

In der Festhalle steht der Spruch: „Dieses Haus soll dem gesitteten Fortschritt und der Lebensfreude unserer Arbeiter dienen." Diesem Zweck hat sie im Frieden gedient!

Ich erinnere nur an die alljährlich damals durch abgehaltenen Arbeiterfeste, die über 3000 fröhliche Menschen in ihren Räumen vereinigten, **Menschen jeden Standes, jeder Konfession, jeder politischen Richtung.** Ihr Jungen, fragt sie die Alten!

Jawohl, Herr Ammann, das war Volksgemeinschaft!

Damals konnte das Werk neben ausreichenden Löhnen alljährlich zu Ostern je nach der Beschäftigungszeit Dienstjahrprämien an die Arbeiter auszahlen. Wer mehr als 10 Jahre im Werk tätig war, erhielt die auf eine Aktie entfallende Dividende, oftmals 120 Goldmark.

Damals war ich imstande, zahlreichen Arbeitern durch billige, langsam rückzahlbare Darlehen zu helfen, eigenes Haus und Land zu erwerben, dessen schuldlosen Besitzes sie sich heute erfreuen, und mancher hat es mir jetzt gedankt.

Hat Euch ein Gewerkschaftssekretär schon einmal etwas gegeben? Sehen diese Leute, die das Wort „Gemeinwohl" stets im Munde führten, nicht heute traurig zu, wie alte Arbeiter, die infolge der durch sie verschuldeten Geldentwertung ihr sauer Erspartes verloren, jetzt Hunger leiden müssen, ohne einen Finger zu rühren?

Sie verstanden unter „Gemeinwohl" nur ihr eigenes Wohl,

haben gut für sich und ihre Genossen gesorgt, von Euren Kassenbeiträgen bezahlt und gut gelebt, während Ihr heute schlechter lebt und härter arbeiten müßt als früher.

Ihr waret die Dummen!

Mancher, der seit Jahren zahlte, kann sich heute ausrechnen, daß er mit den gezahlten Beiträgen und Zins und Zinseszins sich auch ein Haus kaufen könnte.

Was habt Ihr davon gehabt von Euren Kassenbeiträgen? Haß und Neid wurde in Eure Herzen gesät und Euch das Leben vergiftet, das doch sicherlich nicht, wie dem Tier, nur aus Essen und Trinken besteht!

Ich rufe Euch die Worte Benjamin Franklins zu: **„Wer Euch sagt, daß Ihr auf andere Weise als durch Arbeit, Fleiß und Sparsamkeit es zu Glück und Wohlstand bringen könnt, dem glaubt nicht, der belügt Euch!"**

Ich wünschte, und sicherlich alle Arbeiter, die schon in Friedenszeiten im Werk tätig waren, daß die damaligen Verhältnisse wiederhergestellt werden könnten.

Das liegt in der Hauptsache in Eurer Hand!

Durch werksfremde Elemente ist die erfolgreiche Zusammenarbeit im Werke, durch die betriebene Politik die deutsche Wirtschaft zerstört. Unser Absatz ist auf 40% des Friedens gesunken, und es muß teilweise mit Verlust verkauft werden, um den Betrieb aufrecht zu erhalten, wie jedem, der es wünscht, nachgewiesen werden wird.

Trotzdem zahlt das Werk auch heute noch an 12 Pensionären und 65 alte Arbeiter und deren Witwen monatliche Renten; 8 alte Arbeiter, die ihr 50jähriges Dienstjubiläum feiern konnten, wurden mit vollem Lohn in Ruhestand versetzt!

Die Wahlen sind geheim!

Wer geordnete Verhältnisse, friedliches Zusammenarbeiten, sicheren, regelmäßigen Verdienst ohne Lohnausfall und Arbeitslosigkeit wünscht, der brauche seinen Verstand,

der wähle rechts!

Friedrich Schott.

Friedrich Schott's pamphlet opposing the trade unions, 1919

come in. Instead of the three men, however, all the Fuchs workers stormed into the laboratory, smashed the windows, forced the doors, and surrounded Director Schott. Without further ado, one youthful worker hit the Director on the head with an iron implement, while others punched and kicked the man who had fallen to the ground. … Amid further threats – shouts of 'Bash him!', 'Blood must flow!', 'Beat him to death!', and many more of the like were heard – the Director was forced into withdrawing the dismissals. However, the assurance previously given by the men that they would then leave was not kept. The Director was violently seized by both arms and dragged into the festival hall where the Fuchs workers had gathered. Only here, after a repeated explanation by the Director, was it possible to persuade the workers of the Fuchs wagon factory to leave."[153]

During these events, numerous workers had entered the factory carrying a red flag and forced all the foremen and workers to stop work and turn off the machines. Despite the immediate draining of the steam boilers, frost damage occurred in numerous pipes and valves. The factory was then at a standstill for several days.[154]

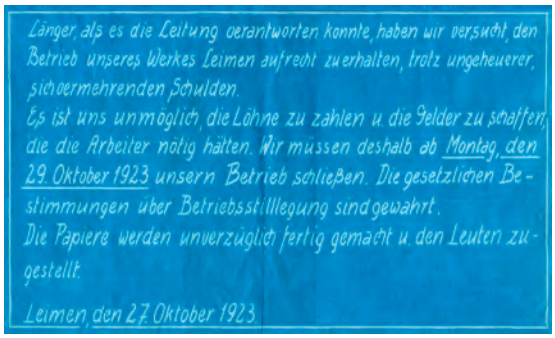
Processing this event as well as the conflicts that had been bubbling underneath the surface for years, resulted in heated discussions lasting for several days. The workers held meetings of up to 800 people, in other words, with the presence of the entire workforce.[155] The factory supervisors passed a resolution demanding the punishment of the ringleaders. Finally, Privy Councillor Friedrich Schott succeeded once again in turning the mood in his favour and calming the situation.[156]

The example is intended to illustrate that strikes in the cement industry, and particularly in the Heidelberg-Mannheim-Stuttgarter Group, were of little significance until then. Nevertheless, strikes are also known to have taken place in Blaubeuren and the later Group plant in Lengfurt during those years.[157]

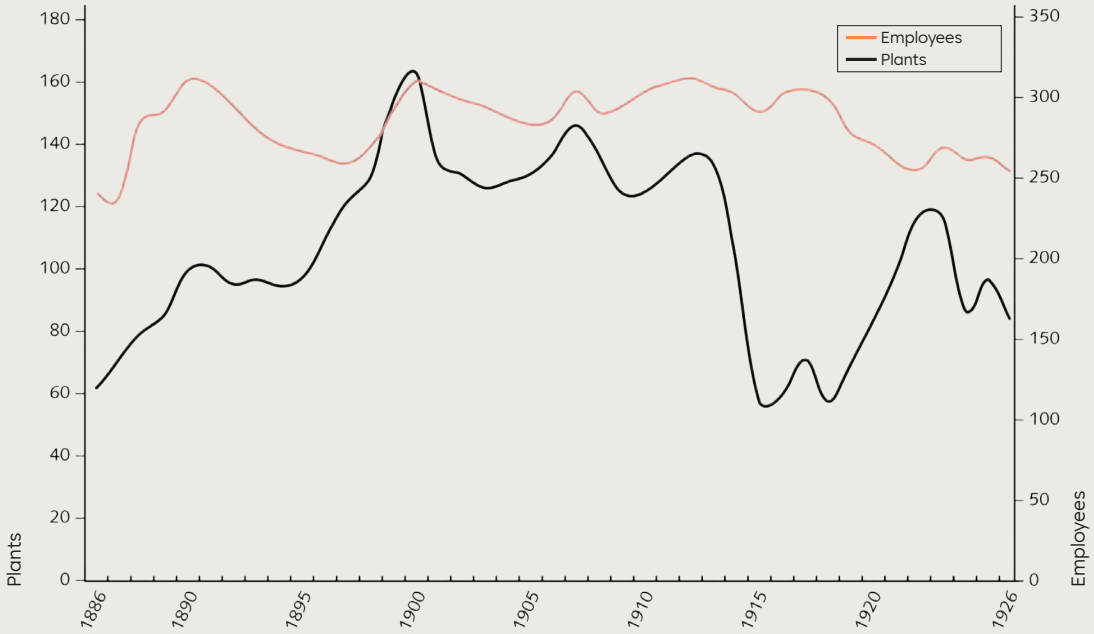
However, despite all the disputes over collective bargaining, the factory management at the various plants were unconventional for the time in providing assistance in the form of goods in kind and fuel to alleviate the major supply crisis affecting the workers. For example, land was made available for cultivating potatoes, and heating fuel was provided at cost price.[158]

The “Golden Twenties” and the Great Depression

Throughout the First World War, the rotary kilns in Leimen and Mainz-Weisenau were in constant operation, unlike those at the company’s other plants. However, as lubricants and other repair materials were scarce and of poor quality, and there was also a shortage of labour, important maintenance work was not carried out. Nevertheless, in order to meet the demand for cement and enable dividend payments, everything was done to increase production.[159]


Länger als es die Leitung verantworten konnte, haben wir versucht den Betrieb unseres Werkes Leimen aufrecht zuerhalten, trotz ungeheuerer, sich vermehrenden Schulden.
Es ist uns unmöglich, die Löhne zu zahlen u. die Gelder zu schaffen, die die Arbeiter nötig hätten. Wir müssen deshalb ab Montag, den 29. Oktober 1923 unsern Betrieb schließen. Die gesetzlichen Bestimmungen über Betriebsstillegung sind gewahrt.
Die Papiere werden unverzüglich fertig gemacht u. den Leuten zugestellt.
Leimen, den 27 Oktober 1923

Announcement of the plant shutdown in Leimen, effective 29 October 1923, because wages could no longer be paid, 27/10/1923.

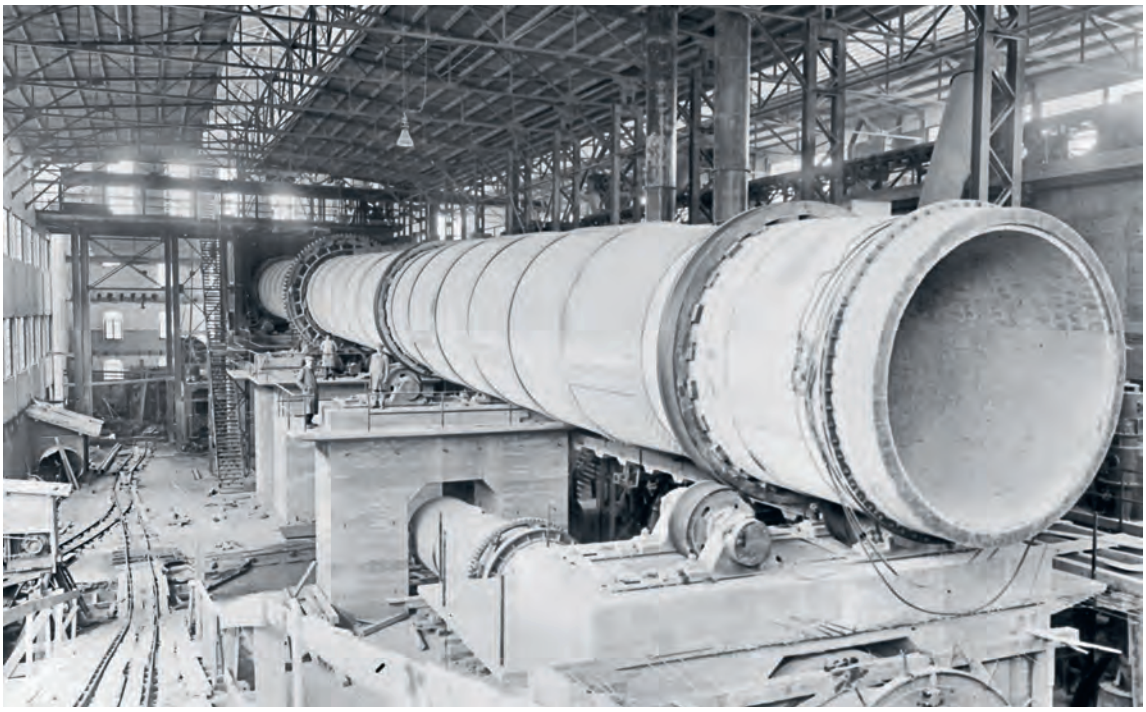


Employees (orange) and number of plants (black). From a peak at the turn of the century of 160 plants, the number of operational factories dropped to 60 during the first world war. After a recovery phase lasting until the peak of hyperinflation, incipient competition pushed uneconomic plants out of the market. The number of employees per plant, which is a measure of the size of the operation, fluctuated around 300 after 1900, but fell steadily after the end of the war. This already reflects the incipient rationalisation of the 1920s.

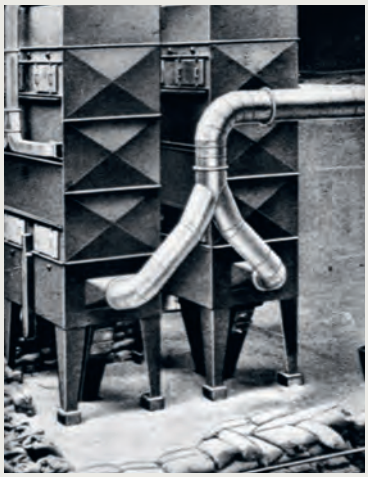
Construction of the new kiln hall in Schelklingen, 1926

The poor material available and the non-stop eight-hour day made it impossible to get the kiln operation going again quickly.[160] A turn-around came in 1920, and there was a steady increase in shipments until 1922. In 1923, when inflation was at its highest, there was a temporary slump. During the hyperinflationary period, only the most necessary investments were made to improve rationalisation and thus reduce production costs. For example, the waste heat from the kilns was used for drying raw materials, which saved fuel. It was not until 1924, after currency stabilisation and the liberalisation of exports, that sales began to rise again. Of 74 public limited companies in 1913, 48 remained at the end of 1923. Even Portland-Cement-Werke Heidelberg-Mannheim-Stuttgart AG (PCW HMS) closed three of its cement plants. These were the Ehingen (1925), Neckarelz (1926), and Offenbach (1926) plants, which had not been able to generate a dividend for years. In the case of the latter, the fact that Friedrich Schott's eldest son Otto, who had been the plant manager, had been killed during the war, played a role in the plant's demise.

During the war years, the Leimen factory had lost a total of 80 workers and supervisors. Others had reached retirement age in the meantime, so there was a shortage of qualified staff. To make matters worse, five master craftsmen died due to illness between 1920 and 1926.



Assembly of the rotary kiln in Schelklingen, 1926



First trials using electrostatic precipitators at the new plant in Burglengenfeld, circa 1925

These men could not be replaced quickly, partly because the company management insisted on hiring its personnel from within the region.[161]

The staffing difficulties continued for many years. As late as 1929, Dr Ehrhart Schott wrote the following in the Annual Report for the Leimen plant:

"It was extraordinarily difficult to find replacements, because those supervisors who were recruited from outside were of little value, and there was a lack of new blood due to the fact that we transferred 34 foremen to other plants between 1907 and 1914. ... Even today, we still lack an energetic foreman for the cement mill, although we have hired a large number of foremen from out of town, who we have always had to send on after a few months."[162]

From 1924 to 1929 – that is to say, in the period beginning with the introduction of the new currency and ending with the onset of the Great Depression – enormous sums were invested in rationalisation in the German cement industry. The transition to large, more efficient machines was a trend that can be attributed to the sharp rise in wages. PCW HMS invested 17 million marks in all Group plants during this time. The Schelklingen plant in particular was expanded following a complete rebuild in 1926 to become the most efficient plant in the region with an output of 150,000 tonnes per year. The fully electrified plant had a rotary kiln and drying drums fired with coal dust. Despite the high investments in the Group plants, their facilities at that point in time were far from modernised.[163]

The Leimen plant was not able to benefit from the investments, partly due to staffing difficulties. It should be borne in mind that Leimen also carried out repairs for the other Group plants at this time. The parent plant remained at its pre-war level in terms of its plant structure, while plants such as Nürtingen, Schelklingen, and Lengfurt, which was taken over in 1922, achieved large increases.

Loesche mill in Blaubeuren, circa 1925

This circumstance is largely due to the existing syndicate, which levelled out the differences in freight costs between the plants, holding back efficient plants.[164]

The Spohn company also invested large sums in mechanical equipment during this period. In 1918, at a time of shortages of staff and coal, the decision was made in favour of automatic shaft kilns. The previous shaft kilns required about a third more personnel than the ring kilns, but they were about 20% more economical in terms of coal consumption. By 1930, the plant had been electrified, cement silos built, and new packaging machines purchased. In order to increase the plant's efficiency, a fundamental change in production conditions was necessary. With the commissioning of the automatic shaft kilns, it became apparent that the raw meal had to be ground more finely.[165]

In response to an enquiry sent to his Berlin machine factory, the inventor of the automatic shaft kiln Curt von Grueber described the construction of a contemporary manufacturing plant in a letter at the beginning of February 1931. Von Grueber was convinced that a factory producing cement to meet local demand with a 100-to-120-tonne high-capacity shaft kiln with a rotary grate, in combination with a Loesche mill with a dryer on the raw side and a Loesche mill on the cement side, would be superior to any other kiln system.[166]

In size and configuration, the Loesche mill was a novelty in Germany. This completely new type of mill could grind and dry simultaneously and produced a much finer grade product than had never been achieved before.[167] Until then, a tangle of transmissions, belts, dust, and noise had prevailed in the raw mill hall. With the construction of the new mill, the machine hall was given a new look.[168]

The short "Golden Twenties" period was followed by a deep recession from 1928 onwards. The Leimen plant had a capacity of 400,000 tonnes in 1929, but it was only able to ship 250,000 tonnes. The Group plants therefore had to try to survive the low capacity utilisation with the smallest possible overheads. Restricted operation met with great difficulties in Leimen. With partial operation of the kilns, there would not have been enough steam to grind the raw material and coal as well as drive the rotary kilns. Therefore, the factory had to curtail operations by shutting down completely for months at a time.[169]

In 1931, the plant only ran from 7 April to 31 October. Having hitherto continued to be paid even during shutdowns, the supervisors were now also subjected to wage reductions and individual dismissals. There was no Christmas bonus in 1931.[170]

Enamel sign of "Wetterau", 1910

“Gleichschaltung” under National Socialism

Friedrich Schott (*27/12/1850 Gandersheim †20/02/1931 Heidelberg) with wife Emma, née Fischer (*27/02/1852 Seesen †01/04/1928 Heidelberg), in front of their home at Mühlstraße 8, now Fehrentzstraße, 1926

The downturn of the global economy that began in 1929 as a result of the Wall Street Crash demanded company management capable of taking action. Since 1916, plant managers Dr Ehrhart Schott and Adolf Schott had held positions on the Managing Board. Adolf Schott, the brother of Privy Councillor Schott, was seriously ill.

Ehrhart was a good chemist and technician, but not suitable for the role of Chairman. Under these circumstances, the Supervisory Board decided to appoint chemist Otto Heuer[171] as Chairman of the Managing Board to fill the position left vacant by Dr Carl Vogel.

Heuer’s professional qualifications were beyond question. In 1910, he had become General Manager of the Portland-Cement- und Kalkwerke AG in Schimischow in Upper Silesia (now Szymiszów, Poland). He held that position until 1926 when he went to work for Schütte AG in the clay industry in Minden, Westphalia. During his time in Schimischow, he acquired several plants. By buying stakes in the Groß-Strehlitz and Groschowitz cement plants from Grundmann, he paved the way for the later mergers in the Silesian cement industry. Under his leadership in Heidelberg, the PCW HMS then also concluded a joint-interest agreement with the Schlesische Portland-Cement-Industrie AG in Oppeln (now Opole, Poland), which lasted until 1936. This contract was largely the result of efforts by Friedrich Schott.[172]

Privy Councillor of Commerce Friedrich Schott (Dr.-Ing. e.h. Dr. rer. nat. e.h.) died on 20 February 1931. Since 1875, he had driven the development of the company and was the leading force behind many associations in the German cement industry. The chairmanship of the Supervisory Board was assumed by the former deputy, Friedrich Kirchhoff (Dr.-Ing. e.h). The last representative of the Schifferdecker family on the Supervisory Board, retired Lieutenant Colonel Emil Anderst, also died a few years later, prompting the formation of new structures on the Supervisory Board.

Wilhelm Brans (Dr.-Ing.), circa 1930

Meanwhile, the entire company's shipments fell to 397,000 tonnes in 1931. The plants in Leimen, Weisenau, Lengfurt, Burglengenfeld, and Nürtingen were periodically shut down. The Kiefersfelden, Münsingen, and Schelklingen plants were shut down for the whole year. The situation was similar in 1932, when production reached an all-time low. Even Leimen only managed the same level of shipments as in 1903.[173]

Unlike today, workplaces at the plants were not largely free of political propaganda. As already indicated, it circulated in the form of leaflets and undoubtedly as expressions of opinion, too. From December 1927, the internal newspaper with its "political broadcasting" also functioned as a mouthpiece for German nationalists.

After the National Socialist party (NSDAP) seized power, it immediately tried to set up so-called factory cells in the plants and to appoint factory overseers. The latter monitored political attitudes in the plants. They often exerted strong pressure on plant managers who were not themselves National Socialists.[174] Dr Ehrhart Schott immediately took decisive action against this and threw the people out, since he did not tolerate any external interference in the business in this respect either. This wasn't the only thing that brought him into the NSDAP's sights. As a promoter of the so-called "business-friendly" or "yellow" trade unions, he had incurred the wrath of both the free trade unions and the National Socialists. On 5 May 1933, the National Socialist newspaper Volksgemeinschaft finally announced triumphantly: "Cement king Dr Schott in protective custody."[175]

In its propaganda, the NSDAP justified this step by saying that Schott had been imprisoned for his own protection due to great agitation within the workforce. Under the dictates of the NSDAP, Dr Schott had no choice but to resign from his posts on 9 May 1933.[176] Immediately after his resignation, a works meeting was held at the Leimen plant, at which Hormuth, Commissioner for Trade Union Affairs, spoke:

"What the Social Democrats and the Communists promised the workers for years, but never managed to achieve, the National Socialist factory cell organisation has succeeded in doing in a very short time. It has shone a light on a factory whose anti-social attitude has been rebuked for years, and it will not leave until order is established. ... With the resignation of Director Dr Schott, longed-for calm should finally come to the cement plant. We do not refrain from declaring that Dr Schott's national attitude is beyond doubt. All the more regrettable, however, is the fact that Dr Schott has not understood how to establish the necessary social equality between employer and employee."[177]

After Dr Ehrhart Schott´s "suspension" and the retirement of Adolf Schott due to ill health at the end of 1933, there were initially only minor changes to the Managing Board of Portland-Cementwerke Heidelberg-Mannheim-Stuttgart.

Adolf Schott's position was taken up by Wilhelm Brans (Dr.-Ing.) from Burglengenfeld until the end of 1937. However, Ernst Kobe had already joined the Managing Board in 1930 to replace Carl Schindler, the Weisenau plant

Board Member Adolf Schott (*25/06/1873 Seesen †16/06/1934 Nürtingen) retired for health reasons at the end of 1933.

Chairman of the Managing Board Otto Karl Hermann Heuer (*08/07/1877 Hecklingen †1960), 1939

manager, and he remained until the beginning of 1945. Managing Director Otto Heuer had joined the NSDAP on 1 May 1933, a few days before Dr Schott's arrest, which allowed him to lead the company's fortunes until 1941. Immediately after the National Socialists seized power, however, a change of mood was already noticeable in the company's Annual Report. The Managing Board's report for 1932, dated 17 May 1933, stated:

"Even in 1932, a year in which the whole of German economic life threatened to collapse as a result of the political convulsions, we succeeded in solving the commercial and industrial challenges facing our company in such a way that the status quo remained unharmed. …

In accordance with government directives, we have deemed it necessary to start up part of our plants as early as April and May, i.e. earlier than was necessary in view of the available stocks. In this way, we want to intervene intentionally and fundamentally in our people's struggle for work and bread."[178]

However, the agitation led by the National Socialist regime was not limited to infiltration of the factories by party members, rather it spanned the entire economic system. As early as July 1933, the Law on the Establishment of Forced Cartels and, in February 1934, the Law on the Preparation for the Organic Reconstruction of the German Economy paved the way for renewed forced cartelisation. Under the leadership of Otto Heuer, the Cement Association was formed, which was managed as an independent specialist group at the Reich Ministry of Economics from December 1937. He also soon belonged to the Freundeskreis Reichsführer SS, also known as the Freundeskreis Himmler or simply the Keppler Circle.

The tremendous economic boost that the construction industry received as a result of government work programmes and armament projects led to a noticeable increase in cement sales volumes as early as 1933. The investments in new, more efficient kilns and mills now took full effect.

Werks-Zeitung
der
Portland-Cementwerke
Heidelberg-Mannheim-Stuttgart A.-G.
für ihre Werke

Wirtschaftlicher Rück- und Ausblick

Company newspaper, 14/01/1928

Festival hall in Leimen, decorated with swastikas, 1 May 1935

The Managing Board's report in the 1934 Annual Report reveals a great deal of sympathy for the National Socialist leadership. In particular, the dismantling of the free trade unions meets with approval:

"In 1934, under the National Socialist state leadership, German economic life was brought closer to strengthening and to the goal of its inner recovery with powerful energy and the greatest enthusiasm. ... To the same extent, the construction industry has participated in the successful fight against unemployment, whereby it was important from the perspective of economic policy that, on the basis of the National Work Order Act of 20 January 1934, the former wage disputes were eliminated, while the cost of living will in future be placed under the supervision of the Price Commissioner."[179]

Within the plants, political infiltration progressed with regular weekly to monthly roll calls to salute the flag. These were usually followed by communal listening events at which speeches by Hitler from the Reich Party Congresses were broadcast over the radio. Typical events documented in the monthly technical reports provide information about the National Socialist penetration of the workforce:

"On 18 March this year, a company roll call was held in the factory canteen at 5 p.m. On 27 March 1936, 4 p.m., communal event to listen to the Führer's major speech at the

Raising of the flag on the silo roof at the Weisenau cement plant, circa 1936

NSDAP model cement plant in Weisenau. The new sun terrace was to be an example of the "new benefits" promised by the new National Work Order Act, circa 1935.

Parade float in front of the administrative building in Leimen, 1 May 1935

Krupp company. On 28 March 1936, 5:30 p.m., participation of the united followers in the torchlight procession. On 29 March this year, united march to the election at 8:30 a.m."[180]

In particular, 1 May was celebrated as the "Day of National Labour" with the participation of all followers in local events, which ended with so-called comradeship evenings. The social and washing facilities, some of which had been newly created, played a major role in this by promoting the principle of hygienic order, including "racial hygiene" in the National Socialist state.[181]

For the workers, the state labour programmes brought job security, but this was coupled with low wages and work obligations. As a result, wages fell below the level of 1925. The minimum wage was very different for men and women and was graded according to age. Female workers, for example, were paid 29 Reichspfennigs per hour, only about 60% of the hourly wage of an unskilled male worker. A skilled male worker in the same age group were paid 60 Reichspfennigs per hour. Despite other commitments, the NSDAP increasingly became a supporter of big industry, while propaganda ideologised the "German worker" and his role in "national labour."[182]

Parade float with models of production stages: "To have won the German worker for his people is the Führer's greatest pride," 1 May 1935.

The cement industry had been elevated to a key industry in National Socialist Germany. The favourable economic development that the cement industry saw as a result of the government construction projects was not without repercussions for the company management and the employees. Approval of the direction taken by the Reich government could be observed everywhere.[183]

Women in quality control at the Cannstatt brickworks near Stuttgart, circa 1935

Housing development. Dr Friedrich-Kirchhoff housing estate in Weisenau, 1936

Education room above the training workshop in Leimen. In the background, a picture of the Führer, 1935

The technical alterations that had already begun at the end of the 1920s were now intensified. The Labour Service now energetically set about adapting the external appearance of the plants in line with the National Socialist fictions of order and cleanliness. The training workshops and social facilities in particular underwent fundamental modernisation. New training workshops were built on the west side of the Leimen plant.[184]

The works regulations of 1938 demanded unconditional commitment to the National Socialist state as a condition of employment with the company. The plant manager assumed the role of leader within the business:

"The factory leaders and followers form a National Socialist works community based on mutual trust, loyalty, and honour.

Unconditional commitment to the National Socialist state and readiness to work for the national community are therefore indispensable prerequisites for membership of the works community."[185]

This comprehensive state control meant that every critical statement and action against "people, party, and state," as it was termed in common parlance, was subject to repression. The consequences ranged from dismissal to imprisonment by the SS.

All followers under the age of 35 were expected to make themselves available for active service on behalf of the party or its branches. Participation in regular company roll calls as well as in the political, ideological, and occupational "training courses" run by the united trade union "German Labour Front" (DAF) was, naturally, compulsory.[186]

But that was not all: "The duty to maintain health and performance requires that every member of the ranks make use of the opportunities for physical training in company sports facilities, in the National Socialist formations, in KdF ["Strength Through Joy", a recreation and leisure organisation run by the DAF] sports courses, or in sports clubs."[187]

The propagandist activities of the NSDAP and its sub-organisations thus influenced the running of the entire business. Those who took part in the so-called "Reichsberufswettkampf" (National Trade Competition) were rewarded with one day of special leave.[188]

In 1937, full employment was achieved. From this point on, there was a shortage of labour. As a reaction to this, company rationalisation measures were accelerated. The trend towards switching to efficient large-scale units in the raw mills and cement mills as well as in the kilns, which had begun years before, was now rigorously pursued.[189]

Of course, the successes attracted no shortage of approval from the business community.[190] The Spohn company was also drawn into the maelstrom of National Socialist agitation. In its annual 1 May magazine, Der Spohn-Zement, for whose contents plant manager Paul Hemscheidt was responsible, the "Werkschar," or workers' militia, unconcernedly and confidently delivered its slogans:

New washing facility in Weisenau, circa 1935

"The Werkschar supports everything that serves the works community and fights everything that harms the works community. It provides valuable assistance to the factory cell leader and is the link between the followers and the factory leader. ... Its main task is always to achieve ideological penetration of the business. ... One way to spread National Socialist ideas throughout the factory is through cultural work, the organisation of our celebrations. ... The marching footsteps of the columns of the Third Reich must be heard in our battle songs."[191]

From 1936 onwards, the Blaubeuren plant was one of the first to supply road surface cements for the construction of the Reichsautobahn motorway network, and it became a leader in the supply of high-quality cements. For example, while the share of road surface cement deliveries from all Heidelberg-Mannheim-Stuttgart AG plants in the first half of 1936 was 8.6% of their total shipping quota, the share of these shipments at Blaubeuren was 35%. While the construction of the Autobahn network was largely responsible for the sharp increase in profits at the Blaubeuren plant, it hindered various other company lines of business.[192]

"Reichsberufswettkampf" (National Trade Competition) in the locksmith's workshop at the Blaubeuren plant, 1937

The Burglengenfeld cement plant's stand at a trade exhibition, circa 1935

War economy and joint-interest associations

Loading sacks into railway wagons in Leimen, 1935

The numerous takeovers and mergers had left the company with the long name Portland-Cementwerke Heidelberg-Mannheim-Stuttgart AG. In 1938, the decision was made to rename the company Portland-Zementwerke Heidelberg Aktiengesellschaft.

For years, it had been an objective of the Heidelberg Group to strengthen its ties with Portland-Cementfabrik Blaubeuren, not least due to the high quality of its cement. Since 1918, the company had held a third of the share capital, which was finally increased to 42.82% by 1938.

Portland-Cementfabrik, Gebrüder Spohn, located in Blaubeuren, was converted into a public limited company back in 1904. The Portland-Cementwerke Heidelberg und Mannheim and Stuttgarter Immobilien- und Baugeschäft businesses held shares in this company. The Blaubeuren factory subsequently enjoyed a prominent position in the Heidelberg Group, with the Spohns holding senior roles

Dr Friedrich Kirchhoff (*12/07/1859 Iserlohn †16/10/1953 Iserlohn), Chairman of the Supervisory Board 1933–1943, then Honorary Chairman, circa 1920

as members of the Managing Board and Chairman of the Supervisory Board. Their story is told in detail in the book "... a factory disappears."[193]

When selling cement through the South German Cement Association, the Spohns had complained about disadvantages affecting their customer relations. Over several decades, the Blaubeuren plant had built up a strong customer base in Bavarian Swabia and Upper Bavaria. The Heidelberg-based Group in particular urged the South German Cement Sales Offices to organise shipments as close to the plant as possible and to give orders to its Marienstein, Burglengenfeld, and Kiefersfelden plants, which experienced underdelivery. The Spohn plant, on the other hand, had recorded overdeliveries in the South German Cement Association at the end of each year since 1927, apart from 1931. In vain, the Spohn plant's Managing Board had demanded an increase to its shipping quota. Complaints from customers that no Spohn cement could be obtained from the Munich sales office and that a "direct line to God" was needed to receive a delivery had already provoked a strong protest from the Managing Board of the Blaubeuren cement plant in the summer of 1932.

Curiously enough, the cause of the dispute lay in the high quality of the Spohn cement. Since the Stuttgart sales office, which was closer to Blaubeuren, had already consistently demanded a quantity corresponding to the Spohn quota, Spohn cement had become a scarce commodity in the Munich area. For this reason, the South German Cement Association tolerated the constant overdeliveries by Spohn, but on the other hand tried to offer customers alternative brands if possible.[194]

After the Heidelberg-based company had lobbied the South German Cement Association for an additional quota of 1,200 wagons in 1936 and the following years, Spohn was ready to enter talks. The negotiations, which began in October 1938, had initially been conducted by the Heidelberg Group with the intention of a full merger, but the Spohn family opposed this.[195] After two months of negotiations, Spohn concluded a joint-interest agreement with Portland-Zementwerke Heidelberg, giving Heidelberg full authority to direct business operations. In return, the Spohn family received two seats on the Supervisory Board for Richard Spohn, Neckarsulm, and Dr Georg Spohn, Blaubeuren. The joint-interest association was managed by a Board of Directors composed of Dr Friedrich Kirchhoff, Otto Heuer, Richard Spohn, and Dr Georg Spohn.[196]

Loading sacks at the cement plant in Nürtingen, 1938

Labour service in Mannheim with one of the first Vögele ready-mix trucks in the background, circa 1935

In addition to motorway construction, the enormous armament efforts and war preparations by the National Socialists kept the construction industry going at full speed to the tune of around 60 billion Reichsmarks. The demand for the Siegfried Line defences and the Wehrmacht alone amounted to 8.4 million tonnes in 1938, while the demand for the Reichsautobahn was modest at 1.8 million tonnes. The German cement industry was thus drawn into the preparations for war at an early stage.

Unlike in the First World War, the cement industry was classified as "important to the war effort" in good time. By ministerial directive of 30 August 1939, all cement plants remained in full production after the outbreak of war in September 1939, in order to be able to meet the demand for air-raid shelters, aircraft taxiways, barracks, etc. In order to better monitor the armament activities and production targets, the Deutsche Zement-verband (German Cement Association) was founded by order of the Reich Ministry of Economics on 12 October 1940, with compul-sory membership for all German plants.[197]

Until the beginning of 1940, most plants experienced only minor restrictions to production, although a decline in efficiency due to the wartime conditions was already noticeable. The management of the necessary raw and auxiliary materials, especially coal and electricity, and the shortage of operating and repair materials caused cement production to drop further in the following years.[198]

However, due to call-ups and conscription, there was soon a shortage of workers in all operating departments. An example from Burglengenfeld is representative of the situation in most of the Group's plants. In April 1940, the plant manager wrote the following about the workers assigned by the labour office:

"Since the beginning of April, we have been assigned 20 Serbian prisoners of war, for whom we have set up a good camp with a kitchen in the plant. This allocation was urgently necessary, as another 15 followers were called up for military service. It almost looks as if we will have to give these 20 Serbs back, because according to a decree by Reichsmarschall Hermann Göring, state Balkan prisoners are to be assigned to agricultural work. This would be a catastrophe for us, since with the small labour force and the high sickness rate in our workforce, it would be impossible for us to fulfil the tasks assigned to us."[199]

A month later, the Serbs were reassigned, and six Belgians were sent to the factory as replacements. The procurement of foreign labour also remained a problem for the plant:

"Since, despite all our efforts, no further prisoners of war could be assigned to us, we have applied to the Regensburg labour office for 20 foreign workers and have accordingly prepared our prison camp to accommodate them. Although foreign labour costs us much more, we are obliged to secure some workers. So far, however, we have unfortunately not received any allocation and, as with the prisoners of war, we are very sceptical."[200]

Manufacturing concrete ceiling joists at the Leimen concrete plant. Women were repeatedly employed at the concrete plant, circa 1946.

As the war wore on, the high number of call-ups caused growing problems. Although many people were in reserved occupations, the workforce was soon no longer sufficient to meet production targets. In addition to prisoners of war, civilian workers from the occupied territories of Eastern Europe were increasingly used. The civilian workers came on request via the labour offices, whereby the recruitment methods in the occupied eastern territories became increasingly radicalised as the war progressed.

In the early days, recruitment with regular employment contracts was still on a voluntary basis, although the workers concerned usually consented because of great material need. Later, however, the work assignments increasingly took on the character of forced labour, since the employment relationships could not be terminated.[201]

In June 1942, the Blaubeuren plant had 28 prisoners of war, mostly French, in addition to 148 German workers and apprentices. Despite the use of prisoners of war and forced labourers, production figures there also fell. To compensate for the slump in cement sales, lime fertiliser production was increased to 52,000 tonnes. The temporary downturn in cement sales and the worsening supply problems led to the closure of the modern Schelklingen plant in the same year.[202]

Like all cement plants, the Leimen plant, deemed critical to the war effort, was largely exempt from conscription until the early summer of 1940. At the same time, attempts were made to compensate for the labour shortage that was gradually becoming apparent through the increased use of women, but this met with ideological difficulties. Nevertheless, 24 German women worked in the cement plant by October 1944. By March 1944, an average of 50 prisoners of war and male and female civilian workers were employed, especially from Italy, the Netherlands, and France. Due to a strong increase in armament orders, especially in the concrete plant, 25 so-called female Eastern workers arrived in March 1944 alone. A total of 48 female Eastern workers were employed there between 1942 and 1945. The average total number of foreign workers rose briefly to over 150 people at the end of the war.[203] Entire catalogues of prohibitions regulated the treatment of prisoners of war and foreigners and imposed severe penalties for violations.

The living conditions of the individual groups of foreigners were governed by a hierarchy that was regulated down to the smallest detail. Although most workers from the occupied western territories and the allied countries also had to live in camps, they received roughly the same wages and food rations as German workers. German workers, too, had to work ten hours a day, six days a week.[204] The use of Soviet prisoners of war and Eastern workers caused various difficulties in the industry. The food rations for these groups of people were so small that it was difficult for them to carry out work. Often the Soviet prisoners of war arrived at the plants in such poor health that they could not be put to work. However, the sources known and analysed so far give only a very incomplete picture of how the prisoners of war and Eastern workers were accommodated

and treated. Furthermore, it is most likely that no inmates of concentration camps were employed in the plants.

The company management was mainly occupied with fulfilling the specifications from the armament plans. When Otto Heuer retired in 1941, Dr Josef Kellerwessel took over as Chairman of the Managing Board that November. Dr Fritz Gramespacher (until the end of 1942) and Erich Schmidt (Dipl.-Ing.), who had been appointed Deputy Members of the Managing Board in 1937, became full members. In 1939, Emil Scheck joined as an additional Deputy Member (full Member of the Managing Board from 1941 to 1945). When Erich Schmidt (Dipl.-Ing.) was killed in the war in 1940, Dr Werner Koch from Heidelberg was appointed Deputy Member in his place (full Member of the Managing Board from 1941 to 1945).[205]

Metal donation consisting of trophies from the Leimen workers' association for the Führer's birthday. However, the trophies were only gathered for propaganda purposes, as most of them still exist, 1940.

In June 1943, Dr Friedrich Kirchhoff retired and was appointed Honorary Chairman of the Supervisory Board. He was replaced by Dr Hans-Lothar Freiherr von Gemmingen-Hornberg from Saarbrücken.

In the Annual Report for 1943, the last to be written during the war, there was still a strong emphasis on doing one's duty:

"In the reporting year, thanks to the tireless efforts of our entire community of workers, we succeeded in fully meeting the increased war-related demands and also in achieving a satisfactory result in accordance with the contract. Special thanks and recognition are due to the factory leaders and their followers for the work they have done under difficult conditions. All of them, like their comrades at the front, have dedicated themselves in an exemplary manner to the service of the fatherland."

French prisoners of war at the cement plant in Nürtingen, 1944

In the same report, importance was also attached to the honours received from the party:

"In 1943, our Weisenau and Lengfurt plants were again awarded the Golden Flag as model National Socialist factories, with the Weisenau plant also being named a wartime model factory. Furthermore, the plants in Leimen, Blaubeuren, Schelklingen, Kiefersfelden, Burglengenfeld, Cannstatt, and Lochhausen were again awarded the regional certificate for outstanding performance."[206]

During 1944, the catastrophic war began to near its conclusion. The total shipments from the Heidelberg plants had halved between 1938 and 1944. The direct effects of the war, the loss of many more workers, the collapse of transport, and the procurement of raw and replacement materials led to ever worsening working conditions. Nevertheless, production and shipments of 90,000 tonnes still almost reached the previous year's levels. Bottlenecks in transport capacities meant that, for example, the delivery of gypsum and coal came to a temporary standstill, which meant that thus large armament projects for the Reich's engineering unit Organisation Todt could no longer be supplied. In order to be able to produce any cement at all under these circumstances, the proportion of blast furnace slag had to be constantly increased to meet production targets. But even these supplies were lacking.[207]

The increase in output in the last two years of the war was only possible through the intensive use of prisoners of war and forced labourers. HeidelbergCement AG was one of the first companies to participate in the Foundation Initiative of the German Industry "Foundation Remembrance, Responsibility and Future" (Erinnerung, Verantwortung und Zukunft), which was established in 2000 to compensate forced labourers. Despite the difficulty in gathering sources, the research for this initiative revealed that the number of individuals affected must be assumed to be 1,000 in total, although the duration of their stay is hard to determine accurately.

“Zero hour” and reconstruction

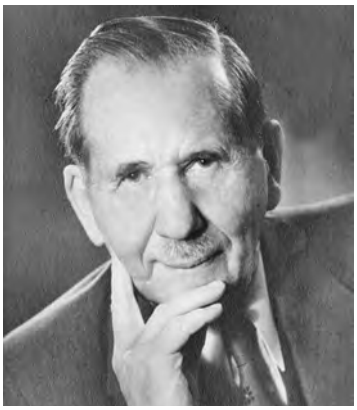
Most of the plants survived the collapse of the Reich in spring 1945 largely unscathed. Material damage mainly affected the Mainz-Weisenau cement plant and the Cannstatt brickworks, as well as buildings in Offenbach, Stuttgart, and Mannheim.[208] However, all plants were affected by looting and the confiscation of supplies and premises. Depending on which allied occupation zone the plants were located, however, they were able to resume operations quickly after a brief interruption. The American military government in particular was interested in the rapid resumption of building materials production. However, the machines and buildings in the plants were completely run down due to the overexploitation of the war years. A rapid increase in production was hindered by bottlenecks in the supply of coal and electricity on the one hand, and by a lack of skilled personnel on the other. A large proportion of the former employees had been killed in the war or had become prisoners of war.

Others could not be employed as a result of the denazification process. In accordance with a law passed by the military government, incriminated persons were relieved of their leadership functions, e.g. as engineers, master craftsmen, or foremen. They were only allowed to continue in lower-ranking roles.[209]

Within a few months, the entire Managing Board was dismissed. In October 1945, Dr Ehrhart Schott, now 66 years old, took over the management of the company together with two other trustees. In March 1946, these three trustees were replaced by one and Dr Schott was appointed to the Managing Board by the Supervisory Board, which had since resumed its functions. Until 1949 he bore sole responsibility for the reconstruction of the company and the resumption of production.[210]

The new company logo from 1938, featuring the lion inside an octagon, was re-registered in 1948.

In 1950, Professor Dr Kurt Schmaltz was appointed to the Managing Board, where he spent more than 20 years as spokesman, primarily putting the emphasis on business administration matters.[211] One of the greatest difficulties was filling the plant manager positions in order to get production moving again quickly.[212]



Dr Ehrhart Schott (*31/07/1879 Heidelberg †19/04/1968 Heidelberg), plant manager in Leimen 1911–1933, Member of the Managing Board 1916–1933 and 1946–1954, circa 1949

Richard Spohn (*22/08/1880 Ravensburg †20/09/1959 Neckarsulm), Member of the Supervisory Board 1939–1958, Chairman of the Supervisory Board 1946–1958, 1950

Prof Dr Kurt Schmaltz (*14/07/1900 Sarreguemines, now France †16/02/1995 Heidelberg), spokesman for the Managing Board 1950–1970, May 1954

The destroyed communications and transport links also caused major problems for the widely scattered factory sites. The period between the end of the war and the currency reform in 1948 was dominated by forced management measures. The victorious powers were convinced that large-scale industry had contributed significantly to the construction of the Third Reich. Therefore, interventions in the economic structures were to take place "in order to destroy the present excessive concentration of economic power." The decartelisation of the German economy by the victors, which had already been decided at the Potsdam Conference, led to the dissolution of the sales associations in the cement industry.[213]

As a result, the entire shipping organisation had to be reorganised. The restrictions imposed by the borders between the occupied zones, the quota system, and the plants' limited production capabilities led to customers buying directly from the plants. This created a decentralised sales organisation. Furthermore, due to the lack of railway wagons, cement transport increasingly shifted to trucks.[214]

Another structural shift in sales was triggered by transport legislation. In order to protect transport by rail and ship, a special tax was temporarily levied on truck transport in 1952.[215] Some customers who wanted to collect cement with their own trucks and whose residence was more than 50 km away from the plant as the crow flies were charged the works long-distance transport tax, as it was known. In order not to lose these customers, the cement plants had to set up customer delivery warehouses. This significantly expanded the sales network and necessitated new organisational measures, such as the establishment of both company-owned and third-party warehouses as well as handling facilities for bulk cement.[216]

With the founding of the Federal Republic of Germany in 1949, there was no longer anything standing in the way of economic recovery. In 1950, an unprecedented boom began for the German cement industry caused by the high level of construction activity, which increased by 600% between 1950 and 1965. Cement sales volumes in West Germany quadrupled in the same period.[217]

The increased use of concrete as a building material created a market for various special cements and mortars. In particular, the growing use of detergents containing sulphates created a market for special cements that could be used in the wastewater sector. The market also demanded autoclave-resistant cements, which were increasingly in demand for the steam curing of precast concrete parts. In cooperation with the main laboratory in Leimen, the Blaubeuren and Nürtingen plants developed, among other things, the highest-value cement Portland cement 475 (1956), masonry cement (1958), DurAtherm blast furnace cement 275 (1962), and anti-sulphate Portland cement 375 (1963).[218] The demands on standard cements also increased. Spatial stability, compressive strength, and also properties such as colour, early strength, post-hardening, and heat of hydration became increasingly important for industrial construction. Although these properties are largely already determined by the proportions of the basic components silicic acid, alumina, and iron oxide in the natural

Stuttgart Town Hall designed by Hans Paul Schmohl and Paul Stohrer. Building using concrete from the Nürtingen cement plant, inaugurated on 4 May 1956

Cement dispatch plant in Andernach, 1961

raw materials, they can also be supplemented by additives. Cement production had thus become a complicated chemical process.

The new requirements for performance and quality, as well as the reduction of dust emissions, called for new kiln technology. Starting in 1926, Dr Otto Lellep and Maschinenfabrik G. Polysius AG in Dessau had developed the Lepol kiln, named after its inventors, which was first used in Germany in 1929.

Lellep had carried out essential preliminary tests at the Leimen test facilities. The basic principle of the Lepol kiln is based on using the waste heat from the kiln to preheat the raw meal. On a travelling grate, the hot kiln exhaust gases flow through the raw meal that has been granulated into pellets, resulting in energy savings of up to 50%.[219]

The Blaubeuren shaft kiln plant took delivery of the first efficient Lepol kiln (LO I) from Beckum in 1955. In the following year, the Blaubeuren and Schelklingen plants entered a “cement sales union.” By this time, the sales areas in the Alb-Danube region had already consolidated and were back to pre-war levels. The cooperation between the Blaubeuren plant and the Heidelberg Group, which had begun with one share in 1904 and had been regulated by an inter-company agreement since 1938, finally led to integration into the Group on 22 June 1966. For the Blaubeuren plant, this integration into the financially strong Heidelberg Group made it possible to build a second Lepol kiln, which was urgently needed in view of the continuing boom. In the same year, the second Lepol kiln (LO II) with a capacity of 1,350 tonnes of clinker per day was put into operation, after which the old shaft kilns were shut down.

The geographical positioning of the ten cement plants, grinding plants, brickworks, and lime and gypsum plants in southern Germany was particularly advantageous for sales planning and coordination when setting up a sales organisation. From the mid-1950s, the high demand for building materials led to rationalisation and drastic changes in the use, transport, and storage of cement.

Whereas cement had previously been transported almost exclusively in sacks by rail, from 1953 onwards there was an increasing switch to bulk cement, which was transported to the construction sites and concrete plants by means of specially equipped vehicles, so-called silo trucks, where it was decanted into cement silos.

At the beginning of the 1960s, the proportion of bulk cement transported already accounted for around 50% of total cement sales, which made an expansion of the shipping facilities necessary. Numerous measures and investments, from the loading and weighing equipment in the plants to the cement silos and scales on the construction sites, were required as a result. Bulk loading also permanently changed packinghouse work.[220]

On 1 May 1957, a new shift system with an upper limit of 49 hours per week was introduced in all the Group’s plants.[221] At that time, a 40-hour week was already widespread abroad, including in Switzerland, which meant a productivity advantage. This was due to the

Silo trucks at the Weisenau cement plant, circa 1953

fact that the same work was done in three shifts without overlaps and with shorter weekly working hours. On the other hand, there was also general resistance in the workforce to the reduction of weekly working hours, as this was associated with a loss of income.[222]

With the closure of the joint sales offices after the Second World War and the transition to a decentralised system, sales offices were set up in Munich and Stuttgart at the beginning of 1950 to support customers. These offices took care of orders from the builders´ merchants, the construction industry, and government authorities and maintained close ties with all consumer groups. They were also responsible for providing technical advice to customers. A report on the Stuttgart office, which was located on Friedrichsplatz amidst still vacant former bomb sites, gives a picture of the construction boom:

"In the meantime, however, the district surrounding Stuttgart's main railway station has changed completely. The German National Garden Show in 1961 contributed significantly to the transformation of the area around the station. However, the building complexes going up around our sales office are sensational. The clatter of typewriters and the ringing of telephones are interspersed with the powerful thuds of diesel pile drivers; the rumbling of large concrete mixing plants, the sounds of pattering gravel and hissing water jets penetrate through the office windows. For this short time, the atmosphere here is ideal for a cement sales office."[223]

Lepol kiln II with control console in Leimen, 1961

Commissioning of the new Lepol kiln "Dr Georg Spohn" in Blaubeuren. Chairman of the Supervisory Board Richard Spohn on the left, Chairman of the Managing Board Dr Eberhard Spohn and plant manager Dr Claus Kühl at the back, 1955

New business lines and expansion of participations

The strong demand for construction materials to rebuild the destroyed cities led Portland-Zementwerke Heidelberg AG to consider setting up its own gypsum and plaster business line. A good opportunity for this arose in Neckarzimmern, where BASF was selling a gypsum pit and a warehouse building in 1946. Back in 1905, the Portland-Zementwerke had been mining gypsum in the Obrigheim gypsum pit on the opposite side of the Neckar. In 1948, the Neckarzimmern gypsum plant went into operation. This was followed in 1953 by the purchase of another gypsum plant in Sulzheim. The manufacture of mixed gypsum, such as bonding plaster and ready-mixed plaster, and of gypsum partition wall panels joined the existing production programme of moulding and stucco gypsum in subsequent years. It was not until 2007 that the Heidelberg Group completely divested itself of gypsum and dry mortar production.[224]

In the mid-1950s, the interest for cement manufacturers also increasingly focused on the fledgling ready-mixed concrete industry. Although the groundwork for this had already been laid at the beginning of the century, it was not until the industrialisation of construction after the Second World War that the break-through came.

In 1959, Portland-Zementwerke Heidelberg AG acquired stakes in several medium-sized ready-mixed concrete companies. The privatisation

View of the Künkele Trichtingen GmbH & Co. KG gypsum plant, taken over in 1971, circa 1976

KVB bulk trucks belonging to the Südkraft transport company, circa 1980

of the passenger and freight transport sector led to the opportunity to acquire a two-thirds stake in the transport and freight forwarding company Kraftverkehr Bayern (KVB), Munich, the following year. Founded in 1919, KVB was one of the leading companies in the industry at that time.[225]

The last takeovers of cement plants had occurred 40 years ago and, as reported, some plants had had to be shut down in the 1920s. Due to the good economic situation in the construction industry, the company management decided to expand production capacities. In 1958, the Zement-, Kalk und Thuramentwerke Sulzbach-Rosenberg were taken over from Nord-Bau GmbH and continued to operate as a cement grinding plant. In 1960, Portland-Zementwerke Heidelberg AG took over a cement grinding plant in Karlsruhe from Anton and Bernhard Bücker-Flürenbrock and acquired a 63.5% stake in Portland-Zementwerke Obergimpern GmbH. The latter also owned a sand-lime brick plant in Durmersheim near Karlsruhe. At the end of the same year, Heidelberg also acquired a clinker plant in Haßmersheim on the river Neckar, together with a cement grinding plant in Kehl from the same family.[226]

Between 1955 and 1960, there was a strong rationalisation drive throughout the German cement industry. The reason for this was the demand-related explosion in coal prices. The sharp rise in wages was countered by automation and rationalisation. For example, high-performance Lepol kilns were built in the Kiefersfelden, Lengfurt, and Leimen cement plants, which were able to produce over 1,000 tonnes of clinker per day for the first time. The era of "white roofs" gradually became a thing of the past with the construction of modern electrostatic precipitator systems. Between 1961 and 1971, the company invested 76 million Deutschmarks in dust filtration systems to clean the exhaust air. Cement shipments reached 4.3 million tonnes in 1960 and the Group employed 4,840 people.[227]

Since the fire in the Heidelberg cement plant in 1895, the company's administration had been housed in various office buildings in Heidelberg, both rented and owned. Most of the administration was located at Riedstraße 4, today Hans-Böckler-Straße. In 1963, the company finally moved into its new administrative building at Berliner Straße 6. Several Roman pottery sites and parts of a cemetery had previously been excavated on the site. Immediately adjacent, the remains of a Roman stone fort were also discovered. In the quarries in Leimen, the Roman lime kilns were found that once supplied the mortar for the construction of the stone


The open-plan office at Riedstraße 4 was unimaginably cramped. The building was acquired in 1925 and used as the headquarters of Portland-Zementwerke Heidelberg AG until mid-1962, 1960.

The new headquarters building at Berliner Straße 6, designed by architect Professor Josef Wiedemann (*15/10/1910 Munich †18/04/2001 Munich), 1963

fort. This was evidence of building material production at this site stretching back almost two thousand years.[228]

In 1963, the company finally took its first step abroad with a 50% participation in the French cement plant Xeuilley near Nancy, which was exchanged for shares in the French company Ciments Vicat in 1968. This participation, which was increased to 35% by 1981, was initially made with the intention of being able to better control cement deliveries from France to German territory. In almost 40 years, it developed into a significant foreign investment. The shares in Vicat were held until 2007 when they were sold in connection with financing the acquisition of Hanson. Another long-term participation was entered into in 1968 with Südbayerisches Portland-Zementwerk, Gebr. Wiesböck & Co. GmbH, in Rohrdorf, Bavaria.[229]

The construction boom, which continued for two decades after the Second World War, had achieved previously unimagined developments, especially in concrete construction. Above all, the increasing use of ready-mixed concrete caused the demand for concrete admixtures to rise significantly. As a result, the production of concrete admixtures began in Leimen in 1970, which were marketed under the brand name Addiment. In the meantime, a generational change took place on the Managing Board. In 1971, Peter Schuhmacher (Dipl.-Kaufmann) replaced Professor Dr Kurt Schmaltz as spokesman for the Managing Board, becoming its Chairman in 1977.[230]

Fair-faced concrete construction with playgrounds made of concrete, circa 1965

Fair-faced concrete construction, circa 1965

From boom to deep depression

Until the beginning of the 1970s, there had been constant growth in the sales volumes of the cement industry, despite cyclical fluctuations. The absolute peak was reached in 1972, the year of the Olympic Summer Games in Munich. When the Organisation of the Petroleum Exporting Countries (OPEC) cut oil production by 5% in mid-October 1973 after the Arab-Israeli Yom Kippur War, and the price of a barrel of crude oil doubled within a very short time, the long-lasting boom came to an end. The abrupt realisation of their dependence on oil and on the oil-exporting countries triggered a recession in the industrialised countries.

The severity of the decline was also the result of fears that were fuelled not least by a widespread, contemporaneous social discussion about the limits to growth.[231]

Concrete climbing wall in the Olympic Park in Munich, October 1972

Ready-mix truck at the Fulda bridge site, May 1967

The Federal Republic of Germany was hit hard by the oil crisis, as it met 55% of its energy needs using imported oil, three quarters of which came from Arab countries. Its parliament reacted on 9 November 1973 with the Energy Security Act, which included comprehensive savings programmes and the intensive search for alternative energy sources. For four weeks in November and December 1973, there was even a driving ban on Sundays. In addition, the maximum speed on motorways and highways was lowered and fuel sales were limited.

While the forecasts for 1972 had still assumed annual growth of 3.5 to 5.5% in real construction investments, the Managing Board was already describing a severe crisis in the Annual Report for the same year: “The long-term orientation data published up to 1972 for the development of national product and construction investments have proven to be wrong.”[232]

The recession triggered by the oil crisis led to a drastic decline in construction investments. Particularly in the construction and automotive industries, there were short-time work, mass redundancies, and company mergers. The general unemployment rate rose from 2.2 to 4.2% between 1973 and 1974.[233]

In addition to the continuing economic slump, a general price increase, and the high interest rate policy of the German Central Bank, the cement industry experienced particular difficulties due to the extreme rise in oil prices. While the price of heating oil increased by almost 250% between 1973 and 1976, the price of cement rose by only 35% in the same period. In a sector as heavily dependent on energy as the cement industry, this led to a sharp drop in results and revealed clear structural weaknesses. The situation was aggravated by the fact that the German cement industry had massively expanded its capacities at the beginning of the 1970s by building new kilns in the belief that the construction boom would continue. These capacities could subsequently no longer be utilised, initiating the so-called structural change, which led to the closure of numerous cement production sites.[234]

In the cement industry, energy costs accounted for about 40% of manufacturing costs until the oil price crisis, when they suddenly exceeded 50%. In the USA, for example, where energy prices were relatively low and wage levels high, the tendency was to build cement plants that could be operated with the lowest possible wage cost per hour. In Germany, on the other hand, with traditionally high energy price levels, technological development led to the introduction of energy-saving burning processes at an early stage. For example, the new second preheater kiln at the Burglengenfeld cement plant, completed in 1974, required 760 kcal/kg of clinker, whereas before that an average of 900 kcal/kg of clinker was required. This new kiln was also able to reach an output capacity of 2,000 tonnes per day.[235]

New preheater kiln at the Burglengenfeld cement plant, 1974

Ready-mix truck in Düsseldorf, August 1977

History of the Lehigh Portland Cement Company

Charles A. Matcham (*15/01/1862 Torquay †22/09/1911 Allentown), founder of the Lehigh Portland Cement Company by the rotary kilns in Evansville, 40 km south-west of Allentown, Pennsylvania, shortly before commissioning, 1909

The history of the Lehigh Valley in Pennsylvania is closely linked to the history of the American Portland cement industry. Excellent lime deposits and the proximity to coal fields and sales markets led to the establishment of the first cement factory in the USA here in 1872. Until the turn of the century, domestic natural cements and imports still dominated most of the market, but with the development of the rotary kiln and the demand stimulated by falling prices, domestic Portland cement production became increasingly important. Just 20 years later, cement plants in the Lehigh Valley served one third of the American cement market, which grew from 1.3 million tonnes to 13.3 million tonnes in the same period. At that time, 80 companies in 150 plants were already producing 99% of US Portland cement.[236] One of these companies was the Lehigh Portland Cement Company, founded in 1897 by six businessmen from Allentown, Pennsylvania. They invested $250,000 to build a cement plant near Ormrod. The Lehigh Valley in eastern Pennsylvania offered excellent conditions for the production of cement. The limestone, which was available

Annual banquet of the executives of the Lehigh Portland Cement Company at the Kirbyville Hotel in Allentown, Pennsylvania, 15/01/1925

in large quantities, already contained the right mix of minerals.[237]

Lehigh soon built a second plant in West Coplay and another factory in Ormrod. As the company shipped its cement as far west as Kansas City, it built a plant in Mitchell, Indiana, in 1902. The following year, a third plant was built in Ormrod and another, larger plant was also added in Mitchell in 1906. In 1907, Lehigh expanded with the purchase of a plant in Fogelsville, Pennsylvania, and in 1911 the company crossed the Mississippi River with the takeover of a plant in Mason City, Iowa.

Three years later, a cement plant in Metaline Falls in Washington State in the northwest of the USA was also acquired. This plant was only two years old. In the same year, Lehigh purchased three more cement plants in New Castle, Pennsylvania. Thereafter, another production site was acquired every year: a grinding plant in Fordwick, Virginia, in 1915, a cement plant in Oglesby, Illinois, in 1916, and a plant in Iola, Kansas, in 1917.[238]

By 1920, Lehigh had grown to become the largest cement manufacturer in the country, with an annual production of more than 12 million barrels (1.9 million tonnes) of Portland cement.[239] In 1923, Lehigh built a large cement plant in the south of the USA, in Birmingham, Alabama. In 1925, four more cement plants were acquired in Alsen in New York, Union Bridge in Maryland, as well as in Bath and Sandts Eddy in Pennsylvania. These acquisitions and the plant in Buffalo, New York, acquired in 1927, increased the number of plants to a total of 21 in ten states.[240]

Lehigh achieved a net profit of $5.9 million on revenue of $30.5 million at this time. By then, this was the highest revenue achieved in the company´s history; revenue declined from there on out. In 1929, with the onset of the Great Depression, revenue was only $19.3 million, and net profit had fallen to $2.7 million. Although the cement price in the USA reached a high of $2.02 per barrel ($12.75 per tonne) in 1930, profits continued to fall due to the sharp decline in cement consumption.

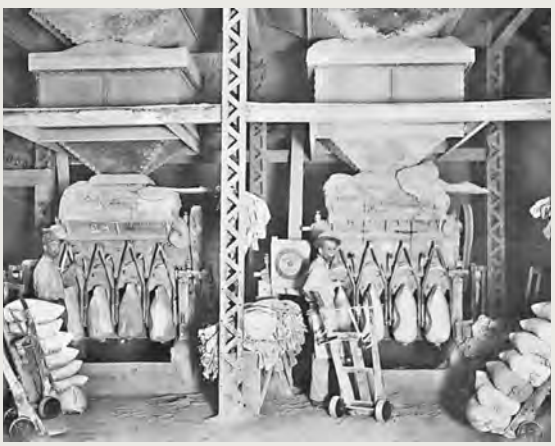
While 72% of the production capacity was being utilised in 1928, this dropped to only 46% in 1931, with the cement price having fallen to $1.15 per barrel ($7.25 per tonne). As a result, the entire cement industry in the USA made losses.[241]

Loading test on a concrete road with a truck loaded with 6.5 tonnes of cement at Glens Falls, New York, 1929

Schöffer shaft kilns in Allentown from the founding period in the Lehigh Valley, 1980

After company founder Edward M. Young died in 1932, his son Joseph S. Young took over the business in difficult times. He succeeded in bringing the company back into profit with low revenues, but only by way of drastic "healthy" downsizing. Joseph S. Young later told a reporter: "Only by throwing eight factories overboard were we able to get out of the storm of the economic crisis." One of the two factories in Mitchell, two plants in Ormrod, the plants in West Coplay and Bath, and all three plants in New Castle were abandoned.

With its remaining cement plants, Lehigh had already reached a production capacity of 22 million barrels (3.45 million tonnes) per year again in 1940, equivalent to more than 8% of total US production capacity. In the same year, the company achieved a net profit of $2 million on revenue of $16.9 million. After the Second World War, revenue and profits increased rapidly, with no change in the number of cement plants and a slight decline in production capacity to 21 million barrels (3.3 million tonnes). Finally, in 1956, Lehigh achieved its highest net profit of $13.1 million on revenue of over $70 million.



Loading sacks by hand, Allentown, Pennsylvania, circa 1927

In the 1950s, the company acquired cement plants in Miami and Bunnell in Florida. The hopes associated with the expansion of production capacity were not fulfilled, however, and profitability declined. While revenue increased, reaching $100.6 million in 1959, profits shrank to $12.1 million. The nevertheless ostensibly good results were mainly due to accounting measures and insufficient provisions for replacement investments. In individual cases, modernisations were also undertaken, for example at Union Bridge, Maryland, where a $15 million project was launched in 1955 to triple the plant´s current capacity of three million barrels (475,000 tonnes). By 1960, this had increased production capacity across the whole company to 31 million barrels (4.9 million tonnes).[242]

During the 1960s, however, the company management decided to close their ageing plants instead of modernising them – some were still operating with the machinery from their founding years. Despite a change in leadership in 1964, when Joseph S. Young passed on the management of the company to his son William J. Young (a position the latter held until 1983), there was no fundamental change in the course taken so far. The Sandts Eddy cement plant was closed in 1962, Oglesby in 1963, Bunnell in 1965, and Fordwick in 1968. The trend continued over the next ten years with the closure of the Iola and Fogelsville cement plants in 1971 and the sale of the Buffalo plant in the

Evansville cement plant, Pennsylvania, circa 1930

same year. Instead of building new cement plants, Lehigh built terminals all over the United States during the 1950s and 1960s to shift cement transport from rail to trucks. From the mid-1960s, Lehigh also invested more heavily in the concrete business line, purchasing four concrete companies: two in Florida, one in Virginia, and one in Kentucky. In 1968, Lehigh even acquired a furniture factory in Florida making low-cost bedroom furniture and a curtain, carpet, and yarn factory in Georgia.

Due to the market situation, Lehigh decided to sell the fledgling concrete business in Virginia, which had since expanded to 11 concrete plants, to Florida Rock Industries Inc. In the same year, several old cement plants were closed, resulting in a total loss of $8.9 million.

Only a total of six cement plants remained in Florida, Indiana, Iowa, Maryland, New York, and Washington. As a result, Lehigh had dropped to 12th place in the market share rankings. The modernisation process begun at Union Bridge was continued at a cost of $9 million, with the plant accounting for 30% of Lehigh's production capacity when it was completed in 1970.[243]

In 1972, Lehigh complied with a directive from the Federal Trade Commission (FTC), the competition and consumer protection agency, and divested itself of 17 concrete plants in Virginia and Kentucky. The company used the sales proceeds to buy back own shares at a price well below book value. In 1974, Lehigh sold its remaining six concrete plants in Kentucky. The sales temporarily increased the company's net profit.

The slump in residential construction that followed the oil crisis also triggered slumps in the home furnishings sector. This, albeit marginal, Lehigh business line made heavy losses. In response, the factory in Georgia was sold. In addition, all activities in the building materials sector in Florida, which accounted for 26% of revenue in 1975, were terminated. The cement and aggregates plants and seven concrete plants were affected. Only the furniture production in Marianna remained in the group for a longer period of time.

Wooden calculator of the furniture factory in Marianna, circa 1980

Acquisition of the Lehigh Portland Cement Company

The uncertain market situation in Germany after the oil price crisis led the Managing Board to consider, in addition to the already initiated expansion of the product range, reducing market dependencies through geographic diversification and opening up new investment and sales markets. In particular, the dependence of the construction and cement industries on government investment programmes repeatedly took its toll when there were austerity programmes and budgetary consolidations. Investigations into potential takeover or partnership candidates quickly focused on the North American cement industry, itself also in crisis, which is why the costs of acquisitions were relatively low. The successful entry of other European companies also spoke in favour of a move into the North American market. Large European competitors, such as Lafarge, Holderbank (Holcim), and CBR, had been involved in the North American cement market since the late 1950s.[244]

The North American cement industry had faced strict antitrust laws from the early stages of its development. These prevented the formation of monopolies through mergers or cartelisation efforts. As a result, the cement market was relatively evenly divided among the companies, and it was rare for one of them to hold a market share of more than 10%. This meant that many companies served clearly defined regional areas, which in turn ensured a certain price stability.[245]

Board members meeting in Allentown on 4 March 1981. Front, from left to right: Dr Eberhard Schleicher, Peter Schuhmacher, Bill Young. Back: Dr Fritz Vöhringer, Theodor Brenke, Fritz Toepel, Dr Peter Otto

The situation did not change significantly in the 1960s and 1970s, despite acquisitions and market battles. The American market was left with numerous medium-sized but financially weak companies. The energy crisis increased the pressure on North American cement manufacturers, whose energy costs per tonne of cement suddenly shot up due to inefficient production. While personnel costs had dominated production costs in previous years, it became clear in times of oil shortages and skyrocketing oil prices how outdated American production techniques were. In the 1970s and 1980s, the low stock market values of American companies meant they presented favourable takeover opportunities for European buyers.

Glens Falls Portland Cement Company. The plant is now one of Heidelberg Materials' oldest still in production, circa 1967.

At the annual general meeting in June 1977, the Chairman of the Managing Board, Peter Schuhmacher, had already informed the shareholders that the reserves for asset maintenance, which had grown to 65 million Deutschmarks, were to be used for new investments in companies in the construction industry. Due to the poor future prospects of the German construction industry, Portland-Zementwerke Heidelberg concentrated on North America and quickly identified three possible candidates: General Portland Inc, Martin Marietta Cement, and Lehigh Portland Cement Company Inc. Discussions regarding possible partnerships, takeovers, or mergers were held with them all. As all three American companies still produced cement using the wet process, high energy costs were to be expected. On the other hand, Heidelberg's expertise offered opportunities to achieve high savings in this area.[246]

Lehigh's position as the favoured candidate quickly became clear. The company was almost debt-free with a share price that was significantly below value. With a capacity of 2.8 million tonnes and revenue of $100 million in 1976, it was here that the lowest investment costs of $104 million could be expected over the next ten years. The plants were mainly located in the states of the mid-east and had extensive land holdings. Through rationalisation and downsizing measures, Lehigh had responded to crises in the previous ten years and shrunk its operations in a "healthy" manner.[247]

Share in Lehigh Portland Cement Company, 10/02/1965

Furniture assembly at Lehigh Furniture, Marianna, Florida, 1975

On 5 September 1977, Germany's Handelsblatt newspaper reported: "Heidelzement makes a grab for the USA." Shortly before, Lehigh Portland Cement Company in Allentown and Portland-Zementwerke Heidelberg AG had declared that the latter had proposed a tender offer to acquire the majority of the Lehigh shares. Lehigh shareholders had until 16 September to decide whether to accept the offer. After two extensions of the offer, Portland-Zementwerke Heidelberg was able to successfully announce the acquisition of a 93% share of Lehigh's share capital on 13 October 1977. The employees in Germany and the public were surprised by this step, as it went far beyond the usual spheres. Until then, activities had been limited mainly to southern Germany. There had only been participations in the cement sector in Vicat and in smaller regional producers. As a result of the takeover in the USA, Portland-Zementwerke Heidelberg came into possession of five cement plants, an expanded clay plant, and a furniture factory.[248] In the year prior to the acquisition, Lehigh had made a profit of $6.1 million on revenue of $119.5 million.[249]

The purchase of Lehigh cost Portland-Zementwerke Heidelberg $85 million (200 million Deutschmarks) and was financed half from its own capital and half from short-term debt. This was later described as a "rock-bottom price".[250]

Thanks to the technical advances brought from Heidelberg, the costs per tonne of cement at Lehigh were significantly reduced and thus the market situation of the American manufacturer was improved in the long term, true to the motto of the Chairman of the Managing Board, Peter Schuhmacher, "not to be the market leader but the cost leader." Within only three years, Lehigh's energy consumption had been cut by 23% and its capacity increased by 17%.[251]

The acquisition of Lehigh by Portland-Zementwerke Heidelberg in 1977 marked the beginning of a decade of expansion by European companies in North America. By 1990, 70% of US cement production and 88% of Canadian cement production was in European hands.[252]

The transformation of the American cement industry in such a short time could hardly have been more dramatic. It was also accompanied by fears of market domination and monopoly formation, accusations made by American commentators against the European cement manufacturers. However, the fear of price increases and market dominance that accompanied the takeovers of American cement manufacturers did not materialise.[253]

In 1980, Lehigh acquired the Universal Atlas Cement Company, a division of the United Steel Corporation. The origins of Universal Atlas date back to 1889.[254] With its acquisition, Lehigh achieved a 7% share of the US market, moving it up to second place.[255] However, on the instructions of the FTC competition authority, Lehigh had to sell the Universal Atlas plant in Hannibal, Missouri, in 1981 to a newly founded company, Continental Cement Co. Lehigh also had to sell three cement terminals and was not allowed to buy any cement plants or terminals in five Midwestern states for ten years without prior approval from the FTC.[256]

Lehigh began further modernisation and expansion of the Union Bridge plant in 1998 with an investment of $200 million, circa 2002.

As a consequence, Lehigh acquired the Cementon plant in New York State from Alpha Industries Portland Inc. and the York plant in Pennsylvania from Medusa Corp. in 1982. By the end of 1985, Lehigh operated cement plants in Leeds, Alabama; Mitchell, Indiana; Mason City, Iowa; Independence, Kansas; Union Bridge, Maryland; Cementon, New York; York, Pennsylvania; Waco, Texas; and Metaline Falls, Washington.

Although furniture manufacturing in Marianna, Florida, was of secondary importance to Lehigh, the opportunity was nevertheless taken in 1991 to increase capacity by 30%. The business line performed better than expected and achieved record revenue of $40 million in 1995, a year before it was sold. Lehigh furniture was found in major sales outlets with large showrooms in High Point, North Carolina, and Tupelo, Mississippi. After it was sold to P.A. Inds., a holding company for several industrial companies, the furniture factory filed for bankruptcy in 1997.[257]

Preheater kiln under construction at the Union Bridge plant, 2002

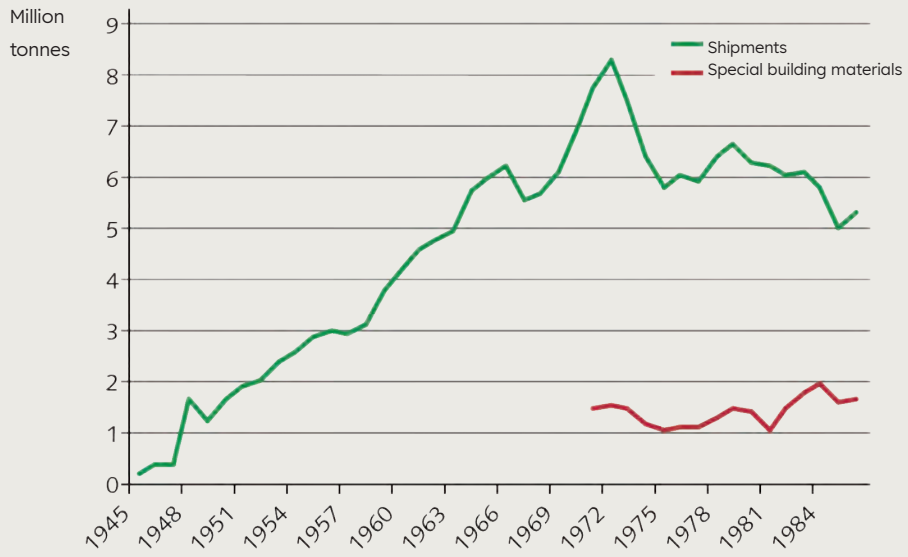
Energy savings and product diversification

Portland-Zement- und Kalkwerke G. Behringer in Neumarkt, circa 1980

Cement shipments from Heidelberg plants fell by 15% to 6.4 million tonnes after the oil crisis. The adjustment of capacities to the declining demand led to the discontinuation of clinker production in Nürtingen in 1977, resulting in the Sulzbach-Rosenberg grinding plant converting to a cement handling centre. In 1988, Portland-Zement- und Kalkwerke G. Behringer in Neumarkt, which had only been taken over in 1974, was closed in order to reduce excess capacities.

Besides the structural adjustment, the energy price crisis initiated a renewed and far-reaching rationalisation process in the cement industry. In response to the increased energy costs, the full automation of the various production steps was pushed forward. In cement shipping, round packaging machines with automatic bag applicators were introduced, followed by the automated shipping of bulk cement.

In the quarries, productivity was increased through the use of heavy-duty trucks with 80-tonne payloads. In the 1980s, about 350,000 tonnes of used tyres were produced annually in the Federal Republic of Germany. Because of their high calorific value, it made sense not to send them to landfill but to use them as a source of energy. By using them as an additional fuel, it was possible to save on high-grade energy sources such as coal. Due



Development of shipments of cement (green) and special building materials (red) between 1945 and 1984

to the high temperatures in the rotary kilns and the flue gas cleaning already in place, used tyres, and other alternative fuels, could be burnt without releasing heavy metals or producing nitrosamines and dioxins. The use of alternative fuels helped to partially compensate for the sharp increase in fuel costs.

Improvements and new developments in cement grinding also yielded great potential to make savings. In cooperation with Krupp Polysius AG, and funded by the Federal Ministry of Research and Technology, a high-pressure grinding rolls were tested for the first time on an industrial scale in Leimen. Based on the principle of high-pressure crushing, this new type of mill made it possible to make energy savings of up to 20% and found worldwide application in a very short time.

Under the Chairman of the Managing Board Peter Schuhmacher, a broad product diversification process began in the mid-1980s. Numerous companies were acquired in Germany and, in some cases, also abroad, including in sectors such as natural stones (marble and granite), insulation systems and packaging made of polystyrene, building chemicals, dry mortar, autoclaved aerated concrete, paper products (cement bags), and transport. This led to the reorganisation of the Group into six business lines: cement, concrete building materials technology, lime-gypsum-plaster, building components, plastics-pressure-paper, and transport specialities. This horizontal diversification of business activities followed a trend of the time, which was also common in other industrial companies and was partly a reaction to the strong economic fluctuations of the 1980s. In connection with the process of geographic expansion and product diversification, the company name was also changed from Portland-Zementwerke Heidelberg AG to Heidelberger Zement AG. In 1987, the Heidelberg Group employed 6,900 people in Germany and abroad. Revenue at that time was 1.8 billion Deutschmarks, with cement still accounting for the majority of this at 63% (36% in Germany and 27% abroad).[258]

High-pressure grinding rolls at the Schelklingen cement plant, 2000

Open borders and emergence as a global player

The political changes triggered by the opening of the Hungarian border in 1989 ultimately led to the fall of the Berlin Wall. With the end of the East-West conflict and the dissolution of the Warsaw Pact in 1991, global economic conditions also changed at a rapid pace.

In this environment, Heidelberger Zement decided to accelerate the internationalisation of its business through acquisitions, among others in Hungary, what was then Czechoslovakia, and Croatia.

The construction boom that began in Germany after 1989 as a result of the mostly state-financed economic development of East Germany initially raised high expectations of a long-lasting upswing. As Heidelberger Zement did not succeed in acquiring cement plants in the new federal states during the privatisation process, the company entered the sand-lime brick and ready-mixed concrete production business in the former German Democratic Republic (GDR).

In order to maintain market leadership in other European countries and worldwide, or to expand into markets with growth potential, Heidelberger Zement looked for a partner who was also active in the cement, ready-mixed concrete, and aggregates sectors. A key requirement was that there would be no market overlap in Europe and America. These conditions were met by the Belgian building

Signing of the contract for the acquisition of CBR in Brussels on 23/09/1993

Tehachapi cement plant in California. With the acquisition of CBR S.A., Heidelberger Zement also expanded its activities to the West Coast of the USA in 1995.

Commissioning of the newly built Guangzhou cement plant in the Chinese province of Guangdong with a capacity of 2.3 million tonnes on 02/04/2005

materials group Cimenteries CBR S.A., which operated plants in Belgium, the Netherlands, Czechoslovakia, Poland, on the West Coast of the USA, and in Western Canada.

The company's 19 cement plants had a combined cement capacity of 17 million tonnes. At the end of September 1993, it was agreed that Heidelberger Zement AG would acquire 42.4% of the CBR share capital from the Belgian industrial holding company Société Générale de Belgique. According to Belgian stock exchange law, all CBR shareholders had to be presented with a purchase offer from Heidelberger Zement, but this offer was rarely taken up. On 21 December, the shares were finally acquired by Heidelberger Zement AG for around 1.2 billion Deutschmarks. From the Belgian perspective, it was particularly important that CBR's Belgian identity and autonomy would be preserved and that its international development strategy would be continued.[259]

In 1994, CBR was fully consolidated due to its unified management by Heidelberger Zement. This doubled Group revenue to 6.3 billion Deutschmarks (€3.2 billion) with 24,000 employees. In CBR, Heidelberger Zement had found an ideal partner for its development into an international building materials group. Being of similar sizes, the two companies complemented each other both geographically and in terms of their product range. In North America, for example, where Heidelberger Zement previously operated through Lehigh on the East Coast of the USA, the Midwest, and

CBR S.A. cement plant in the Belgian town of Lixhe, circa 2000

Çanakkale cement plant in Turkey's Marmara region, circa 2000

in Texas, the purchase of CBR added further locations on the West Coast of the USA and in Western Canada. These included the Redding and Tehachapi cement plants in California as well as the Canadian cement plants in Delta, British Columbia, and Edmonton, Alberta.[260]

In the light of the integration of CBR and the Group's increasing internationalisation, its organisational structure was also adjusted and the Group was divided into regions: Central Europe West, Western Europe, Central Europe East, and North America. The activities in the individual regions were divided into the three business lines cement, concrete, and building materials.

As early as 1995, Heidelberger Zement continued its process of internationalisation by acquiring a 5% minority participation in a cement company in China, which could be expanded at a later date. This company operated three modern cement plants in the southern Chinese province of Guangdong with a capacity of 2.6 million tonnes. Heidelberger Zement gradually increased its participation to 50% by 2004.

After the Annual General Meeting on 12 July 1995, the long-standing Chairman of the Managing Board, Peter Schuhmacher (*12/01/1931 Heidelberg †15/03/2002 Heidelberg), stood down and moved to the Supervisory Board. For 25 years, Peter Schuhmacher was at the head of the company, which grew under his leadership to become one of the world's leading manufacturers of cement, concrete, and building materials. Because of his extraordinary achievements, the Annual General Meeting elected him Honorary Chairman of Heidelberger Zement on 19 June 2001. His successor as Chairman of the Managing Board was Rolf Hülstrunk.

The company's increasing globalisation continued in the years that followed. In 1996, the joint venture Akçansa Çimento Sanayi ve Tikaret A.S. was founded in Turkey with the Sabanci Group as partner. Today, the successful company is one of the largest cement producers in Turkey and also manufactures ready-mixed concrete and aggregates.

Also in 1996, the growing number of employees in various European countries led to the establishment of a European Works Council. Its goal is cross-border employee representation with consultation and information rights.

In 1998, Heidelberger Zement entered the Romanian cement market. Cement participations in Bulgaria and the Philippines, which were acquired in 1997 and 1998 respectively, were

In 1998, Heidelberger Zement AG acquired 51% of Romanian Cement Company Moldocim S.A. Bicaz, circa 1990.

Castle Cement bulk truck on a suspension bridge. The Scancem Group also owned Castle Cement, the second-largest cement manufacturer in the UK, 2005.

Ghacem cement plant Takoradi in Ghana, circa 2000

sold again in 2003, as the company was not able to further expand its market position in these countries at that time.

In Germany, with the exception of the private residential segment, the construction industry experienced a slowdown from the mid-1990s onwards. Despite an overall economic boom, construction activity by the industrial and commercial sectors declined. Increases in production were no longer necessarily accompanied by construction measures, and new technologies and production methods, such as the use of modern information technology and logistics, meant businesses required less space. After the change in tax incentives for private residential construction, the downward trend continued until 2005. Due to the tight financial situation faced by public sector clients, they could not be expected to provide any stimulus. In the main construction sector alone, the number of employees in Germany has fallen from 1.4 million to 0.8 million since 1995. In 2004, construction industry revenue was around 30% below the 1995 value.[261]

Slite cement plant on the Swedish island of Gotland, circa 2000

Ship in the harbour of the Kjøpsvik cement plant in Norway, circa 2000

Kryvyi Rih cement plant in Ukraine, where HeidelbergCement became market leader in 2002, 2010.

The poor situation of the construction industry in Germany spurred Heidelberger Zement on to achieve greater independence from regional recessions through further international growth. In 1999, another suitable partner with only minimal existing market overlaps was found in the Swedish building materials group Scancem AB. Of a total cement capacity of 14.5 million tonnes, 9.2 million tonnes could be attributed to countries in Europe in which Heidelberger Zement had not previously been active. As the only manufacturer in Norway and Sweden, as well as in Estonia, Scancem was the undisputed market leader in Scandinavia. With its subsidiary Castle Cement, the group was the second-largest cement producer in the United Kingdom. In addition to cement and grinding plants in several sub-Saharan African countries, such as Benin, Ghana, Liberia, Niger, Sierra Leone, Tanzania, and Togo, and an import terminal in Bangladesh, Scancem also operated production sites in the USA that ideally complemented the Lehigh plants. After acquiring a majority participation of 73.4% of the share capital and 90.8% of the voting rights in July 1999, the shareholding was increased to 99.8% by a public tender offer to the remaining non-controlling shareholders in October 1999. The total purchase price amounted to 4.7 billion Deutschmarks (€2.4 billion). After the first-time consolidation, Heidelberger Zement's Group revenue rose to 12.5 billion Deutschmarks (€6.4 billion); the number of employees reached over 38,000.[262] The acquisition of Scancem was another important step in Heidelberger Zement's geographical diversification process, offering both expansion into mature markets and new opportunities in growth markets in Africa and Asia. As a result, the company became the world's third-largest cement manufacturer.

The acquisition of Scancem and the associated expansion of Heidelberger Zement's international presence made it necessary to further adjust the Group's regions. Northern Europe and the markets of the future, Africa-Asia-Turkey, were added as additional strategic business units to join the previous regions of Central Europe West, Western Europe, Central Europe East, and North America.

In the year of the Scancem takeover, Heidelberger Zement also acquired a majority participation of 61.2% in Maxit Holding GmbH, which was increased to 75.5% the following year. With the acquisition of a majority stake in the Maxit Group, the company's dry mortar business assumed a clear market leadership role in Germany and in large parts of Europe.[263]

Internal optimisation measures accompanied the international expansion. In order to simplify the participation structures, remove internal hurdles relating to company law, and thus accelerate decision-making processes within the greatly expanded Group, Heidelberger Zement decided to take over the Belgian subsidiary CBR in full by means of a public tender offer. In October 1999, CBR's non-controlling shareholders were therefore given the option to exchange their shares for Heidelberger Zement shares and an additional cash payment. Having already increased from 55.9% to over 94% by the end of 1999, Heidelberger Zement's participation in CBR rose to 98.9% in January 2000 as a result of a second, final offer with

Citeureup cement plant in Indonesia is the company's largest cement production site, circa 2010.

the same conditions. The full takeover of CBR was finally completed a few months later in July 2001, after the remaining CBR shares had been acquired in a squeeze-out procedure.

Rolf Hülstrunk, during whose term of office the acquisition of Scancem marked another remarkable expansion step for the Group, retired at the end of 2000. His successor at the head of the Managing Board was Hans Bauer.

In addition to the acquisition of CBR and Scancem, expansion in Eastern Europe and Asia had been a primary target since the mid-1990s, in order to take advantage of the developing markets in those regions and their great growth potential. In 2000 and 2001, majority participations were acquired in cement plants in Bosnia-Herzegovina, Romania, Ukraine, and Russia. In Ukraine and Romania, the company even became market leader in 2002.

In July 1999, Heidelberger Zement acquired a majority participation of 61.2% in Maxit Holding GmbH. The manufacturer of dry mortar products had leading market positions in Germany and Europe with 1,800 employees in nine countries.

The purchase of a majority participation in the second-largest Indonesian cement manufacturer PT Indocement Tunggal Prakarsa Tbk. in 2001 was particularly significant. Among other things, the company operates three large cement production sites on the islands of Java and Borneo. Due to the booming demand for cement, Indocement continuously expanded its plants and now has a cement capacity of 28 million tonnes.

2001 also saw the commissioning of the Union Bridge cement plant in Maryland, USA, following the complete reconstruction of the production facilities and simultaneous capacity expansion. With a cement capacity of 2 million tonnes, Heidelberger Zement AG's largest and most modern cement plant in the USA thus began production.

Its strong growth in the previous three decades and, above all, its strong international market share also led to the decentralised Group, which already consisted of 500 companies, being given a new mission statement and corporate design. In 2001, the Group name was changed to "HeidelbergCement" as an outwardly visible sign linking the company's international character and the location of its headquarters. By resolution of the Annual General Meeting on 7 May 2002, the parent company finally also changed its name to "HeidelbergCement AG."

Opening of the first production line at the Jingyang cement plant in the Chinese province of Shaanxi in June 2007

While the expansion in the Eastern European and Asian markets continued, the German construction industry was still struggling against severe declines in revenue and price erosion. The long downturn in the construction industry inevitably led to capacity adjustments at all cement manufacturers. In the HeidelbergCement Group, the Kiefersfelden plant was shut down in 2002 and the plant in Mainz-Weisenau was converted into a grinding plant in 2003. With the takeover of plants in Wetzlar and Königs Wusterhausen and the increase of the participation in the Westphalian Anneliese Zementwerke AG to 97.4% through the purchase of shares from Dyckerhoff AG, HeidelbergCement – which until then had concentrated on the south of Germany – also became active in northern Germany. Zementwerk Bosenberg in Ahlen, Westphalia, and a majority shareholding in Teutonia Zementwerk AG in Hanover were also purchased in the following year. In 2003, HeidelbergCement became market leader in Germany.[264]

In January 2005, there was another change at the top of the company. Dr Bernd Scheifele, who had already been appointed as Chairman of the Supervisory Board of HeidelbergCement in May 2004, succeeded Hans Bauer as Chairman of the Managing Board.

After the financial institutions with shares in HeidelbergCement AG – Deutsche Bank and Allianz/Dresdner Bank – had sold their industrial participations at the beginning of the 2000s, following the trend at that time, Spohn Cement GmbH made a tender offer to the HeidelbergCement shareholders in 2005 and acquired 77.95% of the shares. Spohn Cement GmbH was owned by members of the Merckle family,

After entering the cement market in Georgia, the first ready-mixed concrete plant in Ponchiala near the capital Tbilisi was built, 2009.

Bridgeport aggregates plant in Texas, USA, 2008

who had held shares in HeidelbergCement for decades. Head of the family Dr. h.c. Adolf Merckle was a great-grandson of the founder of the Blaubeuren cement plant, Julius Spohn.

From 2005, HeidelbergCement invested in China again with a 50% participation in the Fufeng cement plant in Shaanxi province in the north-west of the country. Together with the joint venture partner Tangshang Jidong Cement, the plant was modernised and another one built. The new Jingyang plant with a cement capacity of 2.3 million tonnes was opened in June 2007. Just one year later, an additional production line was commissioned at each of the two plants, increasing the cement capacity of the joint venture to 9 million tonnes.

The increasing maturity of the market in Eastern Europe now also led to increased investments in the ready-mixed concrete and aggregates business lines here. Market entries in Kazakhstan, Georgia, and India in 2005 and 2006 laid the foundation for further growth in these countries. The Group's activities in India, in particular, were rapidly expanded in the following years. Today, four cement plants and four grinding facilities in central and southern India with a total capacity of 12.4 million tonnes belong to the Group.

Kiln at the South Indian Ammasandra cement plant, 2008

In 2007, HeidelbergCement completed the largest takeover in the building materials sector to date with the acquisition of the British building materials group Hanson PLC for €14 billion. The background to the purchase was, on the one hand, a realignment of the Group strategy and, on the other, the historic and last chance for a major acquisition. This was most notably because, in recent years, almost all of the British competitors in the sector, such as Blue Circle (Lafarge 2001), RMC (Cemex 2004), and Aggregate Industries (Holcim 2005), had been bought by European companies. These companies themselves each had a majority shareholder (anchor shareholder) in the background to "protect" them from private equity.[265] Hanson's shareholding was spread widely among international institutional investors. Further bidders were unlikely, as the above-mentioned cement companies were either unable to act for antitrust reasons or had yet to integrate their recent acquisitions.[266] On 15 May 2007, HeidelbergCement made a formal cash takeover offer to all shareholders of Hanson PLC to acquire its shares at a price of 1,100 pence per share. Hanson's Board of Directors recommended that its shareholders accept the offer. At an extraordinary general meeting on 31 July, the Hanson shareholders voted in favour with a convincing majority of over 99%. The US Federal Trade Commission (FTC) and the European Commission granted

Hanson ready-mixed concrete vehicles in Australia, 2010

their approvals in the first week of August. Authorisation from the High Court of Justice in England and Wales followed on 23 August 2007. This meant that the acquisition of Hanson was completed just over three months after the offer was made.[267]

In addition to HeidelbergCement's traditional core cement business, the acquisition of Hanson PLC was intended to establish aggregates as a second key strategic pillar. This acquisition was largely financed by debt capital, but also by the sale of the 35% share-holding in French cement manufacturer Vicat in June 2007 and building materials subsidiary Maxit in March 2008 to French company Saint-Gobain. With the takeover of Hanson, HeidelbergCement transformed from a cement manufacturer into a building materials group and, with revenue of more than €14 billion in 2008, became one of the largest international building materials groups. As with the purchase of CBR and Scancem, there were no significant market overlaps. In addition to its global market leadership in aggregates, the company also gained attractive market positions in the USA, the United Kingdom, Israel, Malaysia, and Australia. In the United Kingdom in particular, where HeidelbergCement had previously been active exclusively in the cement business line, and in the USA, the company has since operated a dense network of production sites in all business lines.[268]

Wolffdene aggregates plant in Australia, 2005

The history of Hanson PLC – from conglomerate to building materials company

Britons James Hanson (*20/01/1922 Huddersfield, UK †01/11/2004 Newbury, UK) and Gordon White (*11/05/1923 Hedon, UK †23/08/1995 Los Angeles, USA) acquired early business experience in their fathers' businesses at a young age. Finally, they founded a greeting card company Hanson White Ltd in 1958.[269] After a few years, they sold their successful company in 1963 and looked for new business challenges. First, they acquired Oswald Tillotson Ltd., a vehicle distribution company. This in turn was taken over by Wiles Group Ltd., which manufactured agricultural sacks and fertilisers.[270] As part of the deal, Hanson and White received a significant shareholding in the Wiles Group. Gradually, they managed to extend their influence until they had gained sufficient control over the entire group. James Hanson was appointed to the Managing Board in 1965 and soon became its Chairman.[271] Hanson's increased influence within the Wiles Group was reflected when it changed name in 1969, becoming the Hanson Trust.

In Britain, the post-war years were dominated by reconstruction. The consensus across all political parties was first to ensure that the population was provided with basic necessities and later to improve living conditions and prosperity. A further objective was to make the economy more competitive and restore it to its pre-war performance.[272]

From the mid-1960s to the mid-1970s, the post of prime minister was held by Harold Wilson of the Labour Party and Edward Heath of the Conservatives. They remained committed to the post-war consensus and sought to establish a welfare state through, among other things, state-led economic policy.

James Hanson and Gordon White, 1989. Photo: Chris Davis/ArenaPAL

Hanson ready-mixed concrete truck in Dundas, Ontario, Canada, 15/02/2017

As an ambitious businessman, Gordon White was dissatisfied with the results of Wilson's political leadership. He complained about over-regulation of the economy, the strong influence of the trade unions,[273] excessively high taxes, and a certain hostility to business.

Nevertheless, state intervention in the British economy does not appear to have harmed the company. The 1973 oil crisis also proved fortuitous, creating opportunities for further takeovers. Hanson concentrated on companies with undervalued balance sheets, but which had the potential for significant improvements in performance. As a result of this rapid expansion in the United Kingdom, 24 companies with a total revenue of £120 million already belonged to the Hanson Trust by the end of 1973.[274]

In 1976, James Hanson was awarded a knighthood. Ironically, the proposal was made by Prime Minister Harold Wilson, who held office again from 1974 to 1976. The political and economic orientation of the government of Margaret Thatcher, who steered the fate of the United Kingdom from 1979, was very much in line with James Hanson's ideas. The government rigorously pursued pro-business policies, privatisation in the public sector, and the weakening of trade unions.[275] In 1983, James Hanson joined Thatcher's Conservative Party and supported it with generous donations. He also became involved with various British organisations, for example donating £400,000 to the British Sport Trust to encourage young people to join and support sports clubs in the United Kingdom.[276] Hanson received another honour in the year of Thatcher's re-election in 1983. She backed his elevation to a life peerage.

Hanson ready-mixed concrete truck in New York, 22/03/2018

Ready-mixed concrete plant for construction sites at Kings Cross in London, 26/10/2015

Due to the economic policies of the Wilson and Heath administrations, Hanson and White decided to expand into the United States in order to benefit from the much lighter regulation of the markets there. From New York, Gordon White acted as Hanson's key business partner, ensuring the expansion of the industrial conglomerate.[277] This fruitful cooperation is also reflected in the name of the American subsidiary of the Hanson Trust, which traded as Hanson Industries from 1974 onwards.

Hanson Industries gained stability and improved creditworthiness through White's acquisitions, which included the purchase of the fish processing company Seacoast[278] for $32 million. In 1981, the US building materials manufacturer McDonough, which produced cement and concrete in particular, was acquired for $185 million. This was the largest takeover of a building materials manufacturer to date.

Gordon White was also awarded a knighthood. Margaret Thatcher nominated him to become an Ordinary Knight Commander of the Civil Division in 1979, her first year in office.[279] Her choice was justified for his "services to British commercial and community interests in the United States."[280]

In the United Kingdom, James Hanson took over the major building materials company London Brick in 1983 for a sum of £247 million. It was the UK's largest and most important manufacturer of bricks.[281] In the following years, more companies were bought, increasing the spheres of influence of the two companies led by James Hanson and Gordon White.

Increasingly, the attention of the company owners turned to the building materials industry. They had recognised that stable revenue could be anticipated in the long term from this line of business, not least due to large public sector projects. In 1987, the Hanson Trust was not only renamed Hanson PLC, but it also made another acquisition in the building materials sector, that of Kaiser Cement in California, for $250 million. The typical pattern of Hanson's takeover strategy was seen again in 1988 with Kidde, a US conglomerate with 108 companies in its portfolio, which was acquired for $1.7 billion. Hanson absorbed the profitable parts of the business in particular, while the unprofitable ones were sold off. Just three months after its successful acquisition by Hanson PLC, Kidde's headquarters were closed as a result of the consolidations. In 1989, Hanson PLC achieved annual revenue of over £1 billion.[282]

Hardly a year went by without a significant acquisition. In 1990, Hanson PLC acquired the Peabody Group for $1.223 billion, but this marked its zenith as an industrial conglomerate.[283] Hanson PLC's assertive strategy met with admiration on the one hand, and vehement rejection on the other. This was clearly demonstrated by the largest planned takeover in the company's history: the attempt to acquire the British company Imperial Chemical Industries (ICI) in 1991.[284] The fierce resistance and defensive measures prompted James Hanson to refrain from making a takeover bid. At the time, Hanson PLC was the second-largest company in the United Kingdom, employing 75,000 people.[285]

Gravel pit in Wolffdene near Brisbane, Queensland, Australia, 06/10/2010

The accumulation of conglomerates, a practice Hanson had been undertaking for some time, became increasingly unpopular with investors. The economic crisis at the beginning of the 1990s contributed to the retreat of many companies into established industries that were thought to be safe. Hanson's failed attempt to buy the British chemical giant Imperial Chemical Industries also dampened the mood for offensive takeovers. As a result, Hanson began to streamline its portfolio. James Hanson, who had been Chairman of the Managing Board at the Wiles Group since 1965 and was now 74 years old, initiated the division of Hanson after Gordon White's death in 1995. Imperial Tobacco, The Energy Group, and the US chemical company Millennium were subsequently split off and listed as independent companies on the stock exchange. The most important business line, which was also the future mainstay, focused on building materials. To this end, various companies from previous acquisitions were brought together, such as the building materials company ARC from the acquisition of Consolidated Gold Fields, Hanson Brick, and the US building materials company Cornerstone Inc.[286]

Workwear with new Hanson logo, 2010

At the turn of the millennium, Hanson's building materials group finally became a globe-spanning company through further acquisitions. The takeover of the Australian building materials company Pioneer in May 2000, which opened up new markets, played a particularly pivotal role.[287]

Financial crisis, climate crisis, and globalisation

The global financial crisis, which began in 2008 with the bankruptcy of Lehman Brothers, led to a change in the shareholder structure of HeidelbergCement AG. In order to reduce net debt, the Group increased its subscribed share capital by 50% in September 2009 by issuing 62.5 million new shares. At the same time, 57.2 million shares in the Merckle Group were replaced. The net proceeds amounted to around €2.2 billion. This measure increased the free float to around 75%, but the heir to the company, Ludwig Merckle, remained the largest single shareholder with a stake of 25%. On 21 June 2010, as a result of the increased free float, HeidelbergCement AG became the first German company in the construction and building materials sector to be included in the DAX 30 benchmark index.[288]

Chairman of the Managing Board Dr Bernd Scheifele ringing the bell at the start of trading on the 125th stock market anniversary of HeidelbergCement, 30/4/2014.

Cimenterie de Lukala with three locations in the Democratic Republic of the Congo, one of the cement plants before participation, 2010

Demonstration calciner at the Lixhe plant in Belgium for the capture of high-purity CO_2, 2019

Opening of the newly built cement plant Novogurovsky/Tula region in Russia in July 2011. With a capacity of 2 million tonnes, it supplies the greater Moscow area, 2011.

At the beginning of the 2010 financial year, HeidelbergCement revised its organisational structure. It was divided into the five geographical Group areas of Western and Northern Europe, Eastern Europe-Central Asia, North America, Asia-Pacific, and Africa-Mediterranean Basin, plus Group Services, comprising its global trading activities, as the sixth Group area. Within the geographical Group areas, the Group's activities are divided into four business lines: cement, aggregates, building products, and concrete.

Following the acquisition of Hanson, cement and aggregates formed the basis of HeidelbergCement's dual raw resource and growth strategy. In the cement business line, expansion in growth markets was the primary objective, while in mature markets the emphasis was on increased vertical integration and securing raw materials in the aggregates sector. The main focus of the investments was on the expansion of cement capacities in the growth markets of Asia, Africa, and Eastern Europe-Central Asia. For example, the company began to construct a new production line with a cement capacity of 4.4 million tonnes at the Citeureup location in Indonesia. With the expansions, the capacity of the largest production site in the Group increased to around 18 million tonnes in 2016. Further new cement plants were built in Kazakhstan, Togo, and Burkina Faso.[289]

Modernisation measures were also carried out in Germany. In September 2014, implementation of the five-year Cement Master Plan began, which included improving environmental performance and increasing productivity at all German cement plants. In 2019, the emission limits for ammonia and nitrogen oxides were further tightened in Germany. Against this background, the kiln lines in Lengfurt, Burglengenfeld, and Schelklingen, some of which were over 40 years old, were upgraded as the company's contribution towards reducing air pollutants. In other plants, for example in North Rhine-Westphalia, the modernisation process affected only certain parts of the production facilities.[290]

In the meantime, climate change increasingly became the focus of public attention and everyday life. As the successor to the Kyoto Protocol, the Paris Agreement adopted on 12 December 2015 was a clear commitment to finding solutions to the problem of global warming. The aim of the agreement is to limit the increase in the average global temperature to well below 2°C, and if possible even below 1.5°C, above pre-industrial levels. As an energy-intensive company in the building materials industry, the Group sees itself as having the responsibility to make its contribution and to make protecting the climate and the environment top priorities within the company. It has always had a focus on developing new technologies to reduce CO_2 emissions from cement production.

In 2016, HeidelbergCement continued on its growth track with the purchase of the Italian building materials manufacturer Italcementi S.p.A. The full takeover of the internationally active Italcementi Group was completed on 12 October 2016 and ideally complemented HeidelbergCement's geographical presence. With the acquisition

The modernisation and expansion of the Tanzania portland cement plant was completed in June 2009, 2009.

of plants and mining sites in 22 countries, HeidelbergCement significantly expanded its market positions. The purchase price for 100% of the share capital of Italcementi S.p.A. amounted to just under €3.6 billion. Of this, just under €2.9 billion was paid in cash and the remaining amount was paid by the issuance of 10.5 million new HeidelbergCement AG shares from a capital increase in return for contributions in kind.

As a result of the combination with Italcementi, the company is now one of the top three international, vertically integrated building materials manufacturers in the core business lines of cement, aggregates, and ready-mixed concrete. To this day, Italcementi's research teams make a decisive contribution to the development of sustainable concrete solutions for modern urban and infrastructure construction.

Through the acquisition, HeidelbergCement extended its international presence to several significant markets in which there was no overlap between the two companies. The portfolio in Western Europe was expanded to include leading market positions in France and Italy. In North America, the company's activities became fully comprehensive, especially in Eastern Canada. The transaction strengthened the Group's market position in the USA, India, and Kazakhstan. In addition, HeidelbergCement achieved market positions in fast-growing markets such as Egypt, Morocco, and Thailand for the first time. The company also gained activities in dynamically growing metropolitan areas, such as Paris, Milan, Cairo, Marrakesh, Chennai, and Bangkok, thereby strengthening its strategic focus on urban centers.

The logic of this acquisition and HeidelbergCement's positive business development in recent years also convinced the rating agencies. In November 2016, S&P Global Ratings, Moody's Investors Service, and Fitch Ratings each awarded the company an investment grade rating. The positive assessment of its creditworthiness was particularly due to the company's strengthened profile following the takeover of the Italcementi Group and its rapid integration. With the investment grade rating, one of HeidelbergCement's main strategic targets was achieved and the financing conditions on the capital market noticeably improved.[291]

In the course of the Italcementi acquisition, HeidelbergCement slightly changed the structure of some Group areas and integrated the newly added countries. Since then, the Group has been divided into the five geographical Group areas of Western and Southern Europe, Northern and Eastern Europe-Central Asia, North America, Asia-Pacific, and Africa-Eastern Mediterranean Basin. The sixth Group area, Group Services, comprises its global trading activities, especially the trading of cement, clinker, and fuels.[292]

The history of Italcementi – a long-established company from the Bergamo region

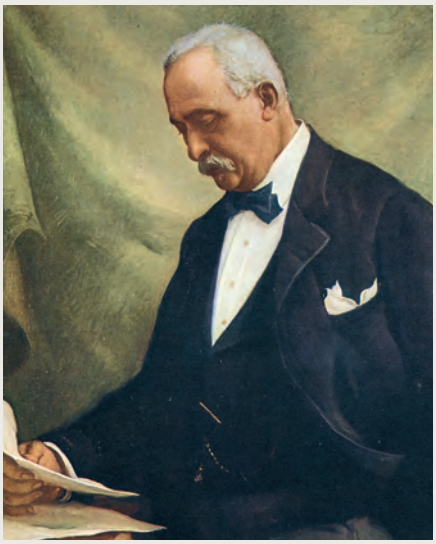
Italcementi's origins date back to the early days of industrialisation and railway construction. To build a bridge over the Oglio river on the Venice-Milan railway line, waterproof, hydraulic lime was needed, which was not produced in Italy at the time and therefore had to be imported from France at great cost. In 1856/57, a lime plant was built in Palazzolo sull'Oglio near Bergamo specifically to meet this demand. The building material had proved its worth and stimulated the founding of new plants.[293]

Around this time, 32-year-old Giuseppe Lorenzo Andrea Piccinelli (*04/12/1832 Scanzo †24/12/1910 Scanzo) was in the process of looking for new investment opportunities after his wine and silk production business was ruined following a severe pest infestation.[294]

He heard about the successful use of hydraulic lime and wanted to try his luck with it. Near Bergamo, not far from Palazzolo, he found a raw material deposit that he thought would be suitable. In 1864, he made his first attempts at burning the lime in his garden at home.[295] Satisfied with the results, he approached financiers and builders and began construction of a cement plant in Scanzo. In 1865, the company purchased a water mill in Bergamo – its first grinding plant, which later became the headquarters of Italcementi.[296]

At the end of 1864, the company was founded under the name Società Bergamasca per la fabbricazione del cemento e della calce idraulica (Bergamo Company for the Manufacture of Cement and Hydraulic Lime).[297]

The plant in Palazzolo sull'Oglio, circa 1884



Giuseppe Piccinelli, founder of Società Bergamasca, circa 1890

The plant in Scanzo, 1867

Scanzo cement, a slow-setting Roman cement, was extremely popular and its use quickly spread on the market. Production reached 7,000 tonnes within two years. More plants soon opened. In 1872, the competitor's plant in Palazzolo was taken over, which also started producing Portland cement shortly afterwards. At the same time, the name of the company was changed to Società Italiana dei Cementi e delle Calci Idrauliche (Italian Cement and Hydraulic Lime Company).[298]

In the summer of 1905, Piccinelli became unable to work due to thrombosis. He died five years later. Since Piero, his only son, was already a successful entrepreneur in another industry, he did not want to take over the business. A merger a few months later put the Pesenti family in charge.[299]

The Pesentis, a family of entrepreneurs from Val Brembilla (about 20 km north of Bergamo) with a history dating back more than 500 years, operated a paper mill in the nineteenth century. The Pesenti brothers heard about the success story of the fledgling cement industry and converted their family business into a cement plant called Fratelli Pesenti fu Antonio. They built their first plant in Nese alla Busa in 1878, which was replaced in 1883 by a second in Alzano Sopra (both districts of Alzano Lombardo).[300]

In 1906, the Pesenti and Piccinelli companies merged under the name Società Italiana dei Cementi e delle Calci idrauliche – Società Riunite: Italiana e Fratelli Pesenti (Italian Cement and Hydraulic Lime Company – United Companies: Italian and Pesenti Brothers), under the direction of Pesenti. The new company produced 210,000 tonnes of cement with 12 plants and over 1,500 employees.[301]

The headquarters in Bergamo, with the Madonna della Neve church pictured on the left, 1884

The Pesenti brothers' plant in Ranica, circa 1890

Over the next few decades, various mergers and acquisitions saw the company greatly expand,[302] and it frequently changed its name. The focus was on keeping the plants up to a high technical standard and building new operating units. By 1913, 15% of the Italian market was already in the hands of the Pesenti brothers.[303]

In 1925, the company was listed on the stock exchange. Just two years later, it owned 33 plants and controlled 44% of cement production across the country, manufacturing 1.8 million tonnes of various types of cement.[304] Another new name, chosen to reflect its nationwide presence, therefore seemed inevitable: Italcementi Fabbriche Riunite di Cemento Bergamo (Italcementi United Cement Factories Bergamo).[305] At this time, the director of the company was Cesare Pesenti (*1860 Alzano Lombardo †1933 Alzano Lombardo), one of the founding brothers, who was not only an industrialist but also a scientist. In addition to his own publications, he also sought lasting cooperation with the academic world and, in 1927, founded a postgraduate further education institution at Milan's university of applied sciences, Politecnico di Milano. The Scuola Master Fratelli Pesenti still exists today.[306]

Portrait of Cesare Pesenti by the painter Giacomo Bosis, circa 1920

After the death of Cesare Pesenti in 1933, management of the company passed to his nephew, Antonio (*16/06/1880 Alzano Lombardo †12/08/1967 Bergamo).[307] During Italy's fascist period, he managed to strike a

Italcementi logo, circa 1940

A ship being loaded with Italcementi sacks in Savona, 19/08/1948

balance between family interests and yielding to political demands. After the war, however, he had to leave the company because of his alleged ties to the National Fascist Party.[308] In 1946, Antonio's cousin Carlo (*15/06/1907 Alzano Lombardo †20/09/1984 Montreal) took charge. He had actually briefly been Managing Director in 1942, but had had to leave the company and Bergamo because of his rejection of the fascist dictatorship.[309] He reorganised the company and founded Italmobiliare, a holding company in which Italcementi had a financial stake. Italmobiliare had the role of acquiring participations in various companies, including businesses outside the construction sector (including banks, newspapers, and insurance companies) in order to secure Italcementi a pivotal position in the Italian economy. The post-war boom also contributed to the economic upturn, from which Italcementi benefited, building 12 new plants across the country between 1947 and 1974.[310] One of them was in Rezzato-Mazzano, not far from Brescia, which opened in 1964 on the occasion of the company's 100th anniversary. Initially, this plant could only produce white cement, but a few years later, after the installation of additional kilns, it was also able to manufacture grey cement in parallel, which was unusual at the time and only possible with special equipment. The plant had a capacity of 800,000 tonnes of grey clinker and 180,000 tonnes of white clinker. The plant was considered very modern, as all production processes could be controlled and monitored from a central control room.[311]

In 1969, Carlo Pesenti was confronted with a takeover attempt by Michele Sindona (*08/05/1920 Patti †22/03/1986 Voghera), a banker with a dubious reputation.[312] By buying up several large companies and banks, Sindona sought to concentrate capital, which could have undermined the Italian financial system. In the process, he also acquired a majority shareholding in Italcementi. Carlo Pesenti saved his company with the support of the Italian government and banks. However, it cost

Construction of a cement plant in Monselice, 26/07/1958

Carlo Pesenti in the newly built Rezzato-Mazzano plant, 1965

Antonio Pesenti, Managing Director of Italcementi from 1933 to 1944, circa 1930

Giampiero Pesenti, long-time Managing Director of Italcementi, 2004

him an enormous sum, part of which he paid out of his private assets and part of which he borrowed. In order to pay off the financing, he arranged for Italmobiliare shares to be sold to Italcementi shareholders at a price of 1:2 (one Italmobiliare share for every two Italcementi shares) against payment of 10,000 lire per share. As a result, Italmobiliare changed from being a subsidiary to becoming the parent company of Italcementi.

After the death of Carlo Pesenti in September 1984, his son, Giampiero Pesenti (*05/05/1931 Milan †24/07/2019 Bergamo), took over the management of Italcementi. Under his leadership, a phase of international expansion began. The most important step took place in April 1992, when Italcementi acquired Ciments Français, the second-largest cement producer north of the Alps. Based in France, the company was twice the size of Italcementi itself. The Italian company became one of the main players in the sector practically overnight, and its revenue tripled from 1,500 billion lire (€774 million) to over 5,000 billion lire (€2.6 billion). The number of its cement plants increased to 51, and they were no longer located only in Italy, but in 13 countries worldwide. Additional plants were acquired in Eastern Europe and South Asia.[313]

In 2004, Giampiero Pesenti moved to the position of Chairman of the Board of Directors, at the same time appointing his son, Carlo Pesenti (*30/03/1963 Milan), Managing Director. At that time, the company had 60 cement plants, 570 concrete plants, 152 quarries, and about 20,000 employees from 19 nations. Carlo Pesenti gave new impetus to international growth, and the following years saw Italcementi also expand into Saudi Arabia and Kuwait.[314]

The new millennium saw upgrades at plants around the world, such as those in Martinsburg, USA; Ait Baha, Morocco; Matera, Italy; and Devnya, Bulgaria, reflecting the latest in efficiency and sustainability.[315]

At the same time, the focus on innovation and sustainable development was intensified. In 2004, Italcementi announced the development of a “smog-eating” cement under the name TX Active. This also marked the beginning of the cooperation between HeidelbergCement and Italcementi, when a licence agreement for the production and marketing of photo-catalytic binders was signed in 2008 and a research programme for their application was established.[316]

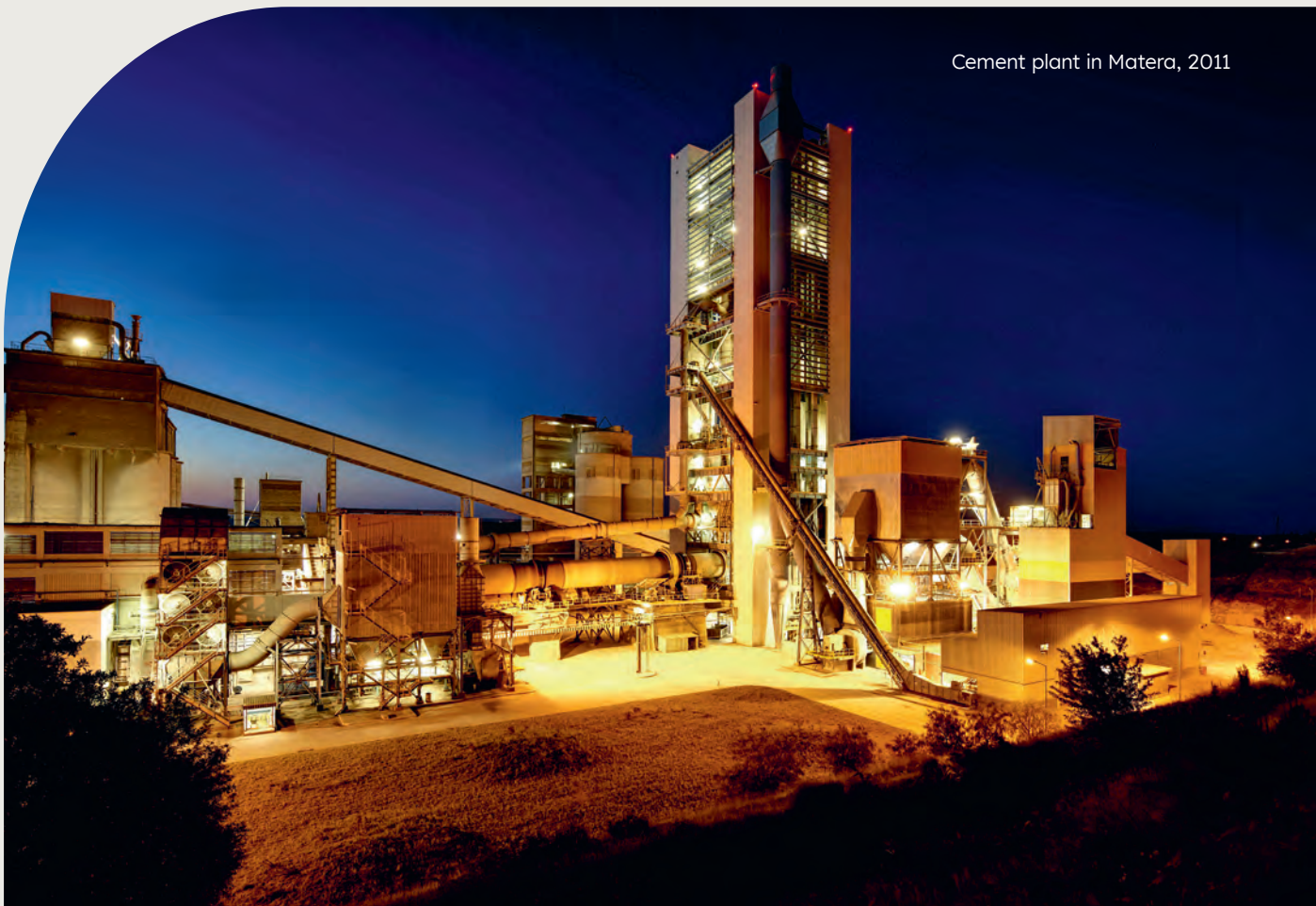
The implementation and support of projects aimed at combatting climate change were also rigorously pursued in the second decade of the new millennium. In particular, modernisations were carried out at the Rezzato-Mazzano plant, where, for example, old kilns were replaced and improved air filtration systems were installed.

These steps significantly improved the plant’s environmental performance and reduced dust emissions by more than 90%. With a capacity of 1.3 million tonnes, it is still one of the most efficient and at the same time most environmentally friendly plants in Europe and was showcased as the company’s flagship site at its 150th anniversary celebration in 2014.

Signing of the TX Active agreement, Carlo Pesenti and Dr Bernd Scheifele, 2008

One of the Group's showpieces was the i.lab research and innovation centre, which opened in 2012 and is located in a dedicated building designed by the architect Richard Meier. It was used by Italcementi's research teams to improve and market research and development.[317] Numerous new products have been developed here, such as i.light, a translucent cement; i.idro, a water-permeable concrete; and i.tech 3D, a dry mortar especially for 3D extrusion printing.[318]

In 2016, Italcementi became part of HeidelbergCement. Its headquarters are currently being relocated from Bergamo to Milan, and its research centre to Calusco d'Adda.[319]



Cement plant in Matera, 2011

Changes at the headquarters in Heidelberg

Due to HeidelbergCement's rapid expansion, the number of employees at its headquarters also grew. The building at Berliner Straße 6 in Heidelberg had been overcrowded for some years. Additional premises had to be rented at several locations in Heidelberg. To unite all departments under one roof, the Managing Board decided to build a new, larger building on the site of the old one. In autumn 2016, the 50-year-old headquarters was vacated and demolished within six months. The foundation stone for the new building was laid in the summer of 2017, and the topping-out ceremony took place in the summer of 2018. The new headquarters building was designed to be particularly climate-friendly. Around 1,000 m² of roof area were equipped with photovoltaics. The base load for heating and cooling is met by renewable energies – in this case, heating and cooling are provided by groundwater, which is drawn from a specially drilled well.

Concreting of the 5th upper floor, 18/10/2018. Photo: Steffen Fuchs

Construction work on the new headquarters, 16/12/2017. Photo: Steffen Fuchs

New headquarters at Berliner Straße 6 in Heidelberg, 08/06/2022. Photo: Steffen Höft

The building meets the requirements of the Platinum Standard, the German Sustainable Building Council's (DGNB) highest standard.[320] Employees were gradually able to move in from May 2020.

On 31 January 2020, Chairman Dr Bernd Scheifele stepped down from the Managing Board after the end of his third term and temporarily retired. After the statutory two-year cooling-off period, Dr Scheifele was elected to the Supervisory Board by the Annual General Meeting in May 2022 and took over its chairmanship from long-standing Chairman Fritz-Jürgen Heckmann, who resigned after 17 years.

Dr Dominik von Achten, who had been a member of HeidelbergCement's Managing Board since 2007 and Deputy Chairman since 2015, succeeded Dr Scheifele as Chairman of the Managing Board on 1 February 2020. He played a significant role in the integration of both Hanson and Italcementi. As Chief Digital Officer, he was responsible for digital transformation and digital ventures.[321]

Shortly after taking office, Dr von Achten was confronted with the challenges of the coronavirus pandemic. In view of the worldwide spread of the disease, all business trips and conferences were replaced by virtual events. In 2020, the Annual General Meeting also took place virtually for the first time in the company's history. With the prompt launch of the COPE (COVID Contingency Plan Execution) action plan in February 2020, a comprehensive package of measures with a focus on cost savings and preserving liquidity was rolled out. Protecting the health of employees, customers, and service providers was a priority at all times. In order to counteract the pandemic-related lockdowns and declines in sales volumes, short-time work was introduced in many countries. In contrast to the first year of the pandemic in 2020, construction activities, and thus the demand for building materials, were not significantly impaired in 2021. However, from the third quarter of 2021 onwards, costs increased significantly, especially for energy and raw materials. Despite all the pressures, it was possible to close the two financial years affected by the pandemic with strong results thanks to cost savings, disciplined investment activities, price increases, and, last but not least, the high level of commitment shown by all employees.[322]

Canteen at the headquarters, 20/05/2020.
Photo: Steffen Fuchs

Sustainability

In 2021, with its “Beyond 2020” strategy, HeidelbergCement set itself an ambitious new interim emissions reduction target. By 2030, CO_2 emissions per tonne of cementitious material should be under 500 kg. By way of comparison, the figure in 1990 was 750 kg of CO_2 per tonne.

To achieve this target, the company is making use of all available technical opportunities. For example, it will significantly increase the proportion of alternative fuels in clinker manufacture, raise energy efficiency throughout production, and steadily reduce the proportion of clinker in its cement. While the first two approaches focus on energy-related emissions, using a lower proportion of clinker in cement cuts specific process-related emissions.

With a view to making climate-neutral construction with concrete possible in the future, the company was quick to trial appropriate production techniques in which the process-related CO_2 emissions are permanently used or stored. At HeidelbergCement subsidiary Norcem in Norway, for example, initial ideas for a carbon capture system in a cement plant were already being explored in 2005. What seemed unrealistic at first slowly took shape over the course of several years of research and development activity and through cooperation with partners. At the end of 2020, the Norwegian parliament finally voted in favour of providing financial support for the implementation of a carbon capture and storage (CCS) project at the Norcem cement plant in Brevik. The world’s first industrial-scale carbon capture facility in a cement plant is expected to reduce emissions by 50% from 2024, which is the equivalent of 400,000 tonnes of carbon dioxide per year. Once captured, the CO_2 will be transported to suitable rock formations under the North Sea and stored there permanently.[323]

At the cement plant in Brevik, Norway, the first industrial-scale carbon capture facility is built, 2022.
Photo: Dag Jenssen

The 3D printing process allows, through appropriate design planning compared to the classic construction method, up to 70% less material consumption and thus a further CO_2 reduction, 2023. Photo: A. Keksel

CCUS projects have also been launched in other Group countries. These include the project in Edmonton, Canada, where the company laid the foundations for North America's first industrial-scale carbon capture, utilisation, and storage (CCUS) solution for the cement industry. HeidelbergCement also initiated a similar project at its British cement plant in Padeswood. In cooperation with the government-sponsored consortium HyNet North West, the carbon capture facility to be built there will be connected to the planned CO_2 transport and storage system. This project will be implemented using hydrogen as an energy source.[324]

Through its persistent efforts in the field of carbon capture, utilisation, and storage (CCUS), HeidelbergCement has established itself as a front runner in the use of this key technology for decarbonising the cement industry. With the above-mentioned projects and others that have already been launched, including in Sweden, Bulgaria, and the USA, the company aims to save a total of 10 million tonnes of CO_2 by 2030.[325]

The company is involved in many other projects that support the targets of the Paris Agreement. For example, it has founded a joint venture with Linde called Capture-to-Use (CAP2U), as a result of which a facility is scheduled to go into operation at Lengfurt plant, which will enable the captured CO_2 from cement production to be recovered for use as a valuable raw material for industrial applications.[326]

Since 2021, the reduction of CO_2 emissions has been anchored in the remuneration of the Managing Board and every bonus-eligible employee worldwide. This underlines the strategic relevance of the climate protection targets.[327]

In order to send a clear signal and take on a pioneering role as a technology leader in the decarbonisation of the industry, HeidelbergCement further sharpened its ambitious climate targets at the beginning of 2022. By 2030, the company aims to cut its specific net CO_2 emissions to 400 kg per tonne of cementitious material, a reduction of 47% compared with the base year 1990. In addition to CCUS, the focus here is on the widespread introduction of increasingly low-carbon cements and concretes, the rapid use of recycled materials, and the application of new technologies such as 3D concrete printing. The company aims to generate 50% of its revenue through sustainable products by 2030 and to achieve net zero emissions by 2050 at the latest.[328]

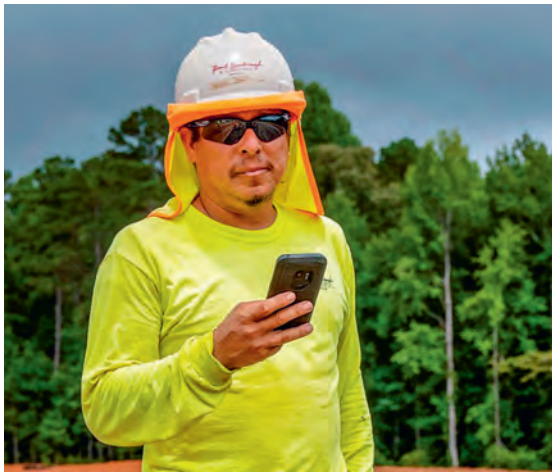
Lengfurt/Main cement plant, 22/10/2020

Digitalisation

By digitalising its operations, the group is pursuing the ambitious target of becoming the first industrial technology company in the construction sector. A key element of this involves cooperation with strategic partners to expand the range of innovative products and services, with the clear aims of reducing the carbon footprint of concrete and further optimising processes for customers.

Digital solutions that represent an interface to customers are an area of focus here. Among other things, the company has developed an app for concrete orders that allows customers to follow a ready-mixed concrete truck's journey to their constructions site in real time. In the customer portal, they can find invoices, orders, delivery notes, and test reports in one convenient place. Another focus is on using digital solutions to enhance efficiency in production processes at the plants. For example, software can be used to optimise production costs in cement plants in real time based on projected sales volumes, inventories, and electricity prices. The company is also working on the continuous improvement of service processes, including through robot-assisted process automation. This involves a type of digital robot that automates and centralises routine tasks in plants, offices, and operating units.[329]

Plant control is now completely digital, as shown here at the Lengfurt plant, circa 2020.



With the HConnect OnSite app, deliveries of concrete to construction sites can be tracked in real time.

Since 2023, the parent plant in Leimen has only operated as a grinding plant, circa 2007.

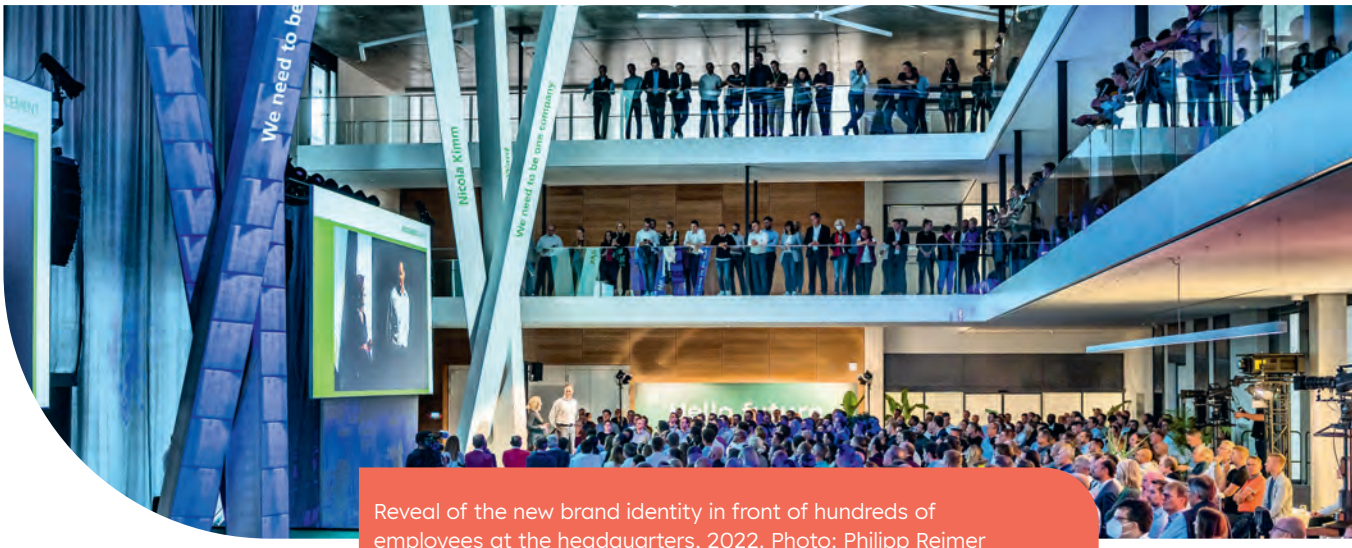
In September 2020, HeidelbergCement announced that it would cease clinker production at the Leimen cement plant at the end of 2022/beginning of 2023. The facility is regarded as the company's parent plant and as the direct successor to the original plant in Heidelberg, which completely burned down in 1895. The decision was made due to the lack of raw material in the exhausted quarry in neighbouring Nußloch. The cable car, which is more than a hundred years old, took its last journey between quarry and plant in mid-January 2023, shortly after which clinker production came to an end. However, the location will be kept and will operate as a grinding plant in the future.[330]

New company name – Heidelberg Materials

On 20 September 2022, HeidelbergCement became Heidelberg Materials. “Heidelberg” has been retained as a synonym for continuity and market leadership. “Materials” replaces “Cement” and stands for an innovative portfolio of sustainable and intelligent building materials and digital solutions. The new logo combines reason and emotion. It brings together the Group’s traditional values and future areas of activity. Two elements, connected in an organic shape, together form the first letter of the brand name: “h”. The larger area represents a structural component and represents Heidelberg Materials’ technical strengths. The smaller element symbolises the Group’s future areas of activity.

The new brand conveys the Group’s commitment to being open to change while remaining approachable and authentic. At the same time, it underlines the fact that Heidelberg Materials is a vital cornerstone of the global building materials industry, with one clear target: to become the first climate-neutral company in the sector.[331] So that it can play to its full strengths as a global team, the company wants to present itself and act consistently in the future and speak with one voice. The first step was to rebrand at Group level, where Heidelberg Materials was immediately introduced as a brand. Since 2023, the Group’s national and international subsidiaries have been gradually rolling out the new brand, including in North America,

Bulk truck and ready-mixed concrete truck with the new company name in front of the headquarters, 2023. Photo: Philipp Reimer



Reveal of the new brand identity in front of hundreds of employees at the headquarters, 2022. Photo: Philipp Reimer

Germany, Spain, France, eight countries in Northern Europe, and the Heidelberg Materials Trading company. On 16 May 2023, Heidelberg-Cement AG was renamed Heidelberg Materials AG and entered in the commercial register.

With the knowledge acquired in recent years, the technologies tested in numerous pilot projects and initiatives, and the support of strong partners, Heidelberg Materials is well positioned to lead the necessary process of transformation in the building materials industry. The Group is focused on expanding its portfolio of sustainable products, rapidly and significantly reducing its CO_2 emissions, proving that manufacturing carbon-neutral products is possible on a large scale, and establishing a circular economy by rigorously implementing the principle of circularity.

The company was also able to make good progress in the first months of 2023. In February 2023, for example, Heidelberg Materials' current and sector-leading CO_2 reduction targets for 2030 were validated by the Science Based Targets initiative (SBTi) within its new 1.5°C framework and recognised as science-based.[332]

In addition to its climate targets, Heidelberg Materials has also refined and expanded its Sustainability Commitments 2030, the pillars of the company's sustainability strategy. Besides climate protection, the commitment to a circular economy, and topics such as biodiversity, water, diversity, and sustainability considerations in the supply chain are now more in focus.[333]

The company is also driving forward its recycling activities and its rigorous implementation of the principle of circularity as part of its portfolio optimisation. The recent acquisitions of leading building materials and recycling companies in Germany, the UK, and the USA are important steps towards realising Heidelberg Materials' circular economy strategy.[334]

Heidelberg Materials has travelled a long and successful, if not always easy, path since 1873. It is one of the few German companies that can look back on such a long history, with the statistics revealing that, on average, businesses only survive to the age of 16, and only about 0.1% of all companies celebrate their 150th anniversary.[335]

Today, the company is a global leader in cement, aggregates, and ready-mixed concrete. In its anniversary year in 2023, the Group employed around 51,000 people at almost 3,000 locations in over 50 countries on five continents. Responsibility for the environment is at the heart of the Group's actions. As a front runner on the path towards carbon neutrality and the circular economy in the building materials industry, its focus is on sustainable building materials and digital solutions for the future. Today, Heidelberg Materials stands for reliability, down-to-earthness, and market leadership – just as it has done for 150 years.

Entrance hall of the headquarters in Heidelberg, 6/7/2020. Photo: Thilo Ross

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Contents and validity of URLs dated 1 April 2023.

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6 Runow, 1998 (as note 4), p. 248.

7 Joachim Leithäuser, Firmengeschichte der Portland-Zementwerke-Heidelberg AG 1860-1944 (unpublished typewritten manuscript), Berlin 1944, p. 249, HM Archive HV 160.

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9 Paul can be found in the Heidelberg University registers for the winter semester of 1866. The entries indicate that he had previously studied in Karlsruhe, probably since 1864. Cf. Gustav Toepke and Paul Hintzelmann, Die Matrikel der Universität Heidelberg. Volume VI: 1846-70, Heidelberg 1907, p. 578. Places of residence: winter semester 1866 to summer semester 1867, Egge (merchant), Plöck 32; winter semester 1867, Kettengasse 25, Dr Puchelt; summer semester 1868, Akademiestraße 2, Frey (engineer). Cf. address books of the Ruprecht Karl University of Heidelberg, winter semester 1866 to summer semester 1868.

10 Leithäuser, 1944 (as note 7), pp. 28-29. Cf. also Runow, 1998 (as note 4), p. 249. Both give the son's date of birth as 14/01/1846. Runow has apparently confused the names, and Leithäuser has confused the daughters' dates of birth. Johann Philipp Paul married Anna Maria Elisabeth Anders (*16/05/1856 Heidelberg †20/05/1931 Heidelberg) on 06/06/1874. The marriage produced a son, Johann Philipp Paul Carl (*24/09/1877 Heidelberg †1937 Heidelberg), cf. HM Archive HV 532.

11 1 taler contained 16.704 g of silver and was equivalent to 2.565 marks in 1876. Cf. Erich Staisch, Zug um Zug, Augsburg 1977, which gives details of the average annual income of Prussian railway officials in 1862. Annual earnings: 300 taler for a guard, 400 taler for an engine driver. Today, with a multiplier

of 7.31, Johann Philipp's share would be worth around €755,000.

12 Leithäuser, 1944 (as note 7), p. 25.

13 Ibid.

14 Heidelberg City Archives, City Council XI. Municipal property, No. 3 fields, meadows, gardens, No. 123, folio 20, 1897/1905, HM Archive ZWL 113.

15 This roughly corresponds to a present-day purchasing power of €2.13 million. 1 taler was equivalent to 1.5 guilders in 1871, 1 guilder was equivalent to 1.71 marks at that time, and 1 euro was equivalent to 1.95583 marks in 2002.

16 Portland-Cementwerke Heidelberg und Mannheim AG 1860–1910 (commemorative publication for the 50th anniversary), 1910, p. 16 f., HM Archive DS 2380 (in the following, referred to as PCWHM, 1910).

17 Johann Philipp Schifferdecker to Heidelberg City Council, 07/08/1873, HM Archive ZWL 11.

18 Cf. also Cramer and Harsányi, 2022 (as note 1), p. 27 f.

19 Leithäuser, 1944 (as note 7), p. 33.

20 Transporting raw materials over relatively long distances was not uncommon in the 1860s and 1870s. The reason for this was related to the composition of the raw materials, which was not yet fully understood at that time. A commitment to a particular location was therefore associated with a high degree of risk. The Portland cement factory owned by J.F. Espenschied in Mannheim had also obtained hard shell limestone and marl from the Hühnerberg mountain near Haßmersheim on the Neckar by ship, and later also from Eschelbronn, Mauer, and Langenbrücken. Cf. PCWHM, 1910 (as note 16), p. 16 f.

21 PCWHM, 1910 (as note 16), p. 31.

22 From 1870 to 2 March 1879, the Fliegende Blätter newspaper published in Munich contained pages of advertisements.

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25 Privy Councillor Friedrich Schott (Dr Ing. et rer. nat. e.h.) on his 80th birthday, in the Portland-Cement-Werke Heidelberg-Mannheim-Stuttgart AG works newspaper, vol. 4, no. 1, 10/01/1931, p. 2. HM Archive SD 4.

26 City of Heidelberg address book for 1874 and 1875 (as at November 1873) and City of Heidelberg address book for 1876 and 1877 (as at November 1875).

27 Freimann, 1988, (as note 3), p. 198.

28 Schott on his 80th birthday, 1931 (as note 25), p. 1. Mein Lebenslauf (My life story). Louise Schott, née Dernedde (*26/04/1830 Kirchberg, †27/08/1910 Heidelberg), circa 1908 (transcript by Gerhard Reitz, Berlin 1992), p. 31, HM Archive, HV 5568.

29 Schott on his 80th birthday, 1931 (as note 25), p. 1.

30 "Scott's cement" refers to a patent-protected product in which the treatment of burnt lime with burning sulphur results in a product with hydraulic properties. The reaction processes were unclear until then. By synthesising burnt lime and sulphurous acid, Friedrich Schott succeeded in demonstrating the composition of the cement as sulphurous acid lime ($CaOSO_2$), quicklime (CaO), and calcium sulphide (CaS). Furthermore, he succeeded in finding additional simplified manufacturing processes and an explanation of the hardening processes. Cf. Dinglers Polytechnisches Journal CCII, 1871, pp. 52–76.

31 Friedrich Schott. Der Heimgang des Industrieführers und Ehrenbürgers der Stadt, in Heidelberger Tagblatt, 21/02/1931, p. 5. Friedrich Schott had already observed hydraulic properties during the annealing of lime and gypsum in his investigations into Scott's cement. This gave him the impetus to investigate the hydraulic properties of strongly annealed gypsum. He was able to show that anhydride heated up to 500°C exhibits weak hydraulic properties and that the resulting gypsum occurs in five different modifications (cf. Dinglers Polytechnisches Journal CCII, 1871, p. 335; Segers Notizblatt, 1872, p. 208; Chemical News, 1872, no. 633, p. 23; Chemisches Zentralblatt, 1872, p. 11; Polytechnisches Zentralblatt, 1872, p. 454).

32 The method was developed in Rüdersdorf near Berlin for quarrying rock. In the process, horizontal tunnels were cut into the quarry face to a depth of up to approximately 8 metres at close intervals. Then the pillars left between the tunnels were blasted, causing all the rock above the tunnels to collapse. The resulting quarry stone had to be crushed by hand and loaded onto trolleys.

33 PCWHM, 1910 (as note 16), p. 33.
34 Karmarsch und Heerens Technisches Wörterbuch, 1877, p. 282 f.
35 Eva-Maria Schroeter, Der Botanische Garten und das Botanische Institut, in Semper-Apertus. Sechshundert Jahre Ruprecht-Karls-Universität Heidelberg 1386-1986. Volume V: Die Gebäude der Universität. Heidelberg et al, 1985, pp. 475-497, here p. 480 f.
36 Jutta Schneider, Das Alt-Klinikum Bergheim, in Semper-Apertus. Sechshundert Jahre Ruprecht-Karls-Universität Heidelberg 1386-1986. Volume V: Die Gebäude der Universität. Heidelberg et al, 1985, pp. 382–431, here p. 382 f.
37 Karlsruhe General State Archives, 356/5595, Grand Ducal District Office of Baden in Heidelberg, Heidelberg, trade and industry: The construction of a ring kiln by the company Schifferdecker und Söhne in Heidelberg in 1882.
38 PCWHM, 1910 (as note 16), p. 33.
39 Runow, 1998 (as note 4), p. 258.
40 His wife Louise also died in Königsberg in 1909 at the age of 88. Church register of the Burgkirche Königsberg. 1877 no. 76: Schieferdecker [sic], Johann Philipp, retired businessman, Gartenstraße 1 Tragheim, died of lung paralysis on 01/10/1877, 76 years old, buried 05/10/1877.
41 Paul Schifferdecker and his wife lived at Handschuhsheimer Landstrasse 2, cf. address book for the City of Heidelberg including the districts of Neuenheim and Schlierbach for the year 1901, Heidelberg 1901.
42 Karlsruhe General State Archives, 269/1566, Public deed on the foundation of the public limited company Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne, with registered office in Heidelberg, dated 17 March 1889.
43 PCWHM, 1910 (as note 16), p. 33. On the granting of procuration, cf. Heidelberger Zeitung, 12/04/1888, and Leithäuser, 1944 (as note 7), p. 47.
44 Trademark register of the Grand Ducal Local Court of Baden in Heidelberg, 14/09/1886, deleted 16/03/1891, now the Mannheim Register Court, HM Archive HV 1359.
45 Heidelberger Zeitung, 05/02/1895, p. 2.
46 Leimen Town Archives, Spezialia IV, Municipal administration, 3. Municipal property, 1888/1901, No. 2205: In the matter of the company Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne, versus the Municipality of Leimen. Reduction of the trade tax for the municipal levy.
47 Karlsruhe General State Archives, 356/5633, Heidelberg, police, construction: Application of the Portland-Cement-Werk Heidelberg for provisional restoration of a part of the factory building destroyed by a fire in 1895.
48 Braunschweiger Tageblatt, 19/03/1895.
49 Leithäuser, 1944 (as note 7), p. 49 f. and Heidelberg City Archives 123/20, Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne: Letter from Friedrich Schott and Carl Leonhard to the City Council, 06/10/1897.
50 Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne, Friedrich Schott and Carl Leonhard to the City Council, 12/01/1897, “We acknowledge receipt of your letter no. 11892 of 16 December of the previous year and are grateful for your agreement with our plans to modify the turbine house. The construction of a director’s flat on the site of the turbine house is not intended for the time being; we would therefore like to save the discussion of these questions for a time when this will be of current interest, while preserving the legal position of both parties.” Letter to the City Planning Office, 03/02/1897, report by Dr Walz of the City Planning Committee, 04/07/1897: “I humbly report to the honourable City Council that we give preference to the red sandstone colour.” Letter from Portland-Cement-Werke Heidelberg to Heidelberg City Council concerning the construction project for the office premises on Untere Neckarstraße [addition of a storey to the turbine house], 12/07/1905, HM Archive HV 219.
51 Heidelberg City Archives 123/20: City Council Records XI, Municipal property, No. 3 fields, meadows, gardens: The sale or use of the former cement plant site, 1897/1905. On the use of the turbine house (extension of Bluntschlistraße to the Neckar) as the boathouse of the Heidelberg Rowing Society, cf. Wolfgang Seidenspinner and Manfred Brenner, Heidelberg. Archäologischer Stadtkataster Baden-Württemberg, vol. 32, Stuttgart 2007, p. 245. Julia Scialpi, Das Heidelberger Thermalbad, in Heidelberg: Das Jahrbuch zur Geschichte der Stadt, 2014.

52 One half of a section of the old factory hall approximately 50 metres long is still largely preserved in its original condition. Today, it houses the cement mill VII.
53 PCWHM, 1910 (as note 16), p. 33.
54 Ibid., pp. 43–45.
55 Portland-Cement-Werk Heidelberg, vorm. Schifferdecker & Söhne, (publication marking the 25th anniversity with testimonials) Heidelberg 1898, p. 8, HM Archive HV 175.
56 Ibid.
57 PCWHM, 1910 (as note 16), pp. 38–39. This set-up was later improved so that the material was crushed into nut-sized pieces straight away in the primary crusher, eliminating the need for crushers; cf. also HM Archive ZWL 154: Leonhard Meyer, Geschichte des Cementwerks Leimen, das Hauptwerk der Portland-Cementwerke Heidelberg-Mannheim-Stuttgart AG, August 1938, p. 4.
58 PCWHM, 1910 (as note 16), p. 40 f.
59 Ibid., pp. 40–42.
60 Ibid., p. 42.
61 Meyer, 1938 (as note 57), pp. 6–7.
62 Ibid., p. 6.
63 Eberhard Spohn, Über die Anfänge der Zementfabrik (essay), n.d., p. 7, HM Archive HV 382. As early as 1878, the Blaubeuren cement works near Stuttgart became a member, followed by Leube in 1882, Schwenk in 1887, and Spohn in 1889.
64 Peter Hans Riepert, Wirtschaftliche Entwicklung und Organisation, in Peter Hans Riepert (ed.), Die deutsche Zementindustrie, Charlottenburg, 1927, p. 959.
65 Tonindustrie-Zeitung (newspaper for the clay industry), vol. 23, no. 13, 07/02/1899, p. 152 and vol. 23, no. 14, 10/02/1899, p. 177.
66 Schott on his 80th birthday, 1931 (as note 25), p. 2.
67 Heinrich Weidner, Die Portlandzementfabrik, ihr Bau und Betrieb, Berlin 1909, p. 202 f.
68 For information about the history of the plant, cf. Petra Garski-Hoffman, Nürtingen 1918-1950, Nürtingen 2011, pp. 23, 34, 41, 53, 56, 61, 72, 77 f., 85, 116 f., 119, 204, 206, 220, 301 f., 394, 397, and 444.
69 Ibid. p. 24 and Riepert, 1927 (as note 64), pp. 960–961. After the collapse of the Northwest-Central German Cement Syndicate at the end of December 1901, the situation worsened considerably. In search of new sales markets, the factories that had joined the syndicate up until 1901 now increasingly pushed into the southern German market, without being bound by prices and delivery quotas.
70 Leimen plant Annual Report 1911, pp. 16–20, 26, HM Archive HV 126.
71 Meyer, 1938 (as note 57), pp. 6–7.
72 Leimen plant Annual Report 1911, p. 8, HM Archive HV 126.
73 Ibid., p. 8.
74 Ibid., pp. 26, 37–38 and Meyer, 1938 (as note 57), pp. 6–7.
75 Leimen plant Annual Report 1911, p. 23, HM Archive HV 126.
76 Meyer, 1938 (as note 57), pp. 6–7.
77 Leimen plant Annual Report 1911, p. 16, HM Archive HV 126.
78 Meyer, 1938 (as note 57), p. 5.
79 Ibid., pp. 6–7.
80 Leimen plant Annual Report 1911, pp. 28–34, HM Archive HV 126.
81 Ibid., pp. 50–51, 65 f.
82 Meyer, 1938 (as note 57), pp. 6–7.
83 Leimen plant Annual Report 1911, pp. 28–34, HM Archive HV 126.
84 In the Rüdersdorf quarries near Berlin, 150 to 300 workers were originally engaged in blasting. The fuse had to be manually attached to each of the explosive charges. When commanded to “fire” by the foreman, the workers would light the fuse at the borehole. Then they had two minutes to get to safety. This procedure made it necessary for a large number of the quarry workers to have a blasting permit.
85 Meyer, 1938 (as note 57), p. 3.
86 Robert Basten and Claude Jeanmaire, Heidelberger Straßenbahnen: Eine Dokumentation über die Heidelberger Straßen- und Bergbahn AG, Villingen/Switzerland 1986, p. 10, HM Archive LIT 94.
87 Municipality of Nußloch purchase records (purchase agreement), 1899-1923, HM Archive ZWL 242.
88 Basten and Jeanmaire, 1986 (as note 86), pp. 11–12. In the documentation, there are some pictures of the stone trains in the photography section under numbers 295 to 301. However, a fire in the HSB archives destroyed some of the documents and pictures, so they are no longer available.
89 Ibid., p. 12.
90 Municipality of Nußloch purchase records (purchase agreement), HM Archive ZWL 242.
91 Leimen plant Annual Report 1911, pp. 4–5, HM Archive HV 126.
92 Meyer, 1938 (as note 57), p. 4.

93 Minute book of the workers' committee 1905–1919, p. 3, HM Archive ZWL 21.
94 Ibid., p. 7.
95 Ibid., p. 1.
96 Ibid., p. 3.
97 Ibid., p. 103 f.
98 Ibid., pp. 25–27. In Leimen, around 50 people received support in 1906 at an annual cost of about 8,800 marks.
99 Leimen plant Annual Report 1911, p. 84, HM Archive HV 126.
100 Minute book of the workers' committee 1905–1919, pp. 65-66, HM Archive ZWL 21: At the 12th meeting of the workers' committee on 22 November 1907, a room was requested in which to drink the bottled beer sold. Further evidence of the canteen's construction date can be found in the site plans for the plant from 1903 and 1909. It can be assumed with some certainty that the new canteen was commissioned in mid-1907. See also the minutes of the Leimen Cement Works Association meeting of 14/06/1903, HM Archive ZWL 84, and the Leimen plant Annual Report 1911, p. 83, HM Archive HV 126.
101 Leimen plant Annual Report 1911, p. 83, HM Archive HV 126.
102 Ibid., p. 83.
103 PCWHM, 1910 (as note 16), p. 87.
104 Ibid., p. 88.
105 Ibid.
106 Summary compiled on 10/09/1908 by Dr Ehrhart Schott for Dr Hack for the municipal council meeting on 11/09/1908, HM Archive ZWL 116.
107 Karlsruhe General State Archives, 69, Baden Collection 1995 SI/550.
108 PCWHM, 1910 (as note 16), p. 40 f.
109 Summary compiled on 10/09/1908 by Dr Ehrhart Schott for Dr Hack for the municipal council meeting on 11/09/1908, HM Archive ZWL 116.
110 75 Jahre Schwimmklub Neptun Leimen 1919–1994, p. 13, HM Archive ZWL 151.
111 PCWHM, 1910 (as note 16), pp. 85–86.
112 Visitors to the swimming pool: 1910: 5,538 (non-employees 10,029), 1911: 8,306 (non-employees 13,463). Cf. Leimen plant Annual Report 1911, p. 84, HM Archive HV 126.
113 PCWHM, 1910 (as note 16), p. 93.
114 B. Riepert, Friedrich Schotts Ehrentag: Die Jubelfeier im Zementwerk Leimen, in Heidelberger Tagblatt, 14/07/1925.
115 Dietmar Cramer, Das Heidelberger Zementwerk in Diedesheim, in Mosbacher Jahresheft, vol. 10, 2000, pp. 148–178, HM Archive LIT 404.
116 Karlsruhe General State Archives 364/4041, Mosbach district office, concerning the construction of a cement plant by the public limited company Cementwerk Diedesheim-Neckarelz (construction plans), 1898-1903, here: letter from Johann Tüncher to the town hall in Diedesheim, 20/10/1905.
117 Dietmar Cramer, Das Geheimnis der Fahne: Eine Geschichte aus der Anfangszeit der Vereinsgemeinde, lecture on 29/05/2008, HM Archive VZL 3280.
118 Tonindustrie-Zeitung, vol. 28, no. 80, 09/07/1904, p. 975 and vol. 28, no. 85, 21/07/1904, p. 1021 and Karlsruhe General State Archives 364/6767, Mosbach district office: Diedesheim, Municipal Administration, Municipal Organisation: local inspection tour 1892–1906, here: inspection visit to Diedesheim 12/11/1904.
119 Report of the Managing Board of Portland-Cementwerke Heidelberg und Mannheim AG, Friedrich Schott, Wilhelm Merz, Christoph Riehm, Carl Leonhard, on the sixteenth business year 1903/1904 to the annual general meeting, 11/03/1905, HM Archive HV 46.
120 Zement- und Beton-Adressbuch Deutschland, ed. Tonindustrie-Zeitung, Berlin 1909, p. 42.
121 The attempt to rebuild the cement plant in Neuffen near the quarry failed because there was not enough water available. Cf. Amtsblatt der Stadtgemeinde Neuffen, 01/07/1912.
122 PCWHM, 1910 (as note 16), p. 25.
123 Leimen plant Annual Report 1911, p. 1, HM Archive HV 126. The hot summers with low water levels had a negative effect on both shipping and hydropower (average output in 1910: 237 hp/174 kW, 1911: 198 hp/145 kW).
124 Riepert, 1927 (as note 64), pp. 950, 956–957.
125 Otto Schott, Bericht über eine Studienreise nach Brasilien im Jahre 1913, HM Archive HV 117.
126 Riepert, 1927 (as note 64), p. 994 f.
127 Ibid., pp. 950, 956–957.
128 Tonindustrie-Zeitung, vol. 39, no. 63, 29/05/1915, p. 345.
129 Ein halbes Jahrhundert Zementwerksgeschichte in Burglengenfeld, in Factory reports, vol. 1, 1963, pp. 2–5, and Annual Report of the Portland-Cementwerk

Burglengenfeld AG 1914, HM Archive HV 462.

130 Ibid., Annual Report of the Portland-Cementwerk Burglengenfeld AG 1915–1917, HM Archive HV 462.

131 Eberhard Spohn, Über die Anfänge der Zementfabrik (essay), n.d., p. 7, HM Archive HV 382.

132 Der Heidelberger Portländer. Portland-Zementwerke Heidelberg Aktiengesellschaft works magazine, special issue for the 75th birthday of Dr Ehrhart Schott, 1954, p. 2, HM Archive DS 41.

133 Fritz Keil, 90 Jahre Zementverein, in Zement-Kalk-Gips, vol. 20, 1967, issue 12, pp. 551–554.

134 Helmuth Albrecht, Vom Caementum zum Zement: Geschichte der Zementindustrie im Alb-Donau-Raum, in Kalk und Zement in Württemberg: Industriegeschichte am Südrand der schwäbischen Alb, ed. Landesmuseum für Technik und Arbeit Mannheim, Ubstadt-Weiher 1991, pp. 167-168. Together with Portland-Cementfabrik Karlstadt am Main, vorm. Ludwig Roth AG, Würzburg, the Portland-Cement-Werke Heidelberg-Mannheim acquired a shareholding in Portland-Cement-Fabrik Elm AG in Elm near Schlüchtern (Hesse) in 1917.

135 Meyer, 1938 (as note 57), pp. 6–7.

136 Mosbach district office, Über- und Nachtschicht in gewerblichen Betrieben: Sonntagsarbeit im Portland-Cement-Werk, 1918–1920, here: letter from Carl Friz and Paul Kieser Grand Duchy of Baden Tax Office in Mosbach, 15/02/1918, Karlsruhe General State Archives 364/3708.

137 Ibid.

138 Ibid.

139 Cited in translation after Julia Weigl, Industrie-Kultur-Geschichte im Landkreis Schwandorf, Regensburg 1994, p. 83, and Amberg State Archives, Burglengenfeld district office, 810/10.

140 Karl Becker, Die geschichtliche Entwicklung des Kalk- & Zementwerkes und des Kohlenbergwerkes in Marienstein, Waakirchen 1982, pp. 12, 30, HM Archive HV 507.

141 Stuttgarter Immobilien- und Baugeschäft, report for the Extraordinary General Meeting on 24/09/1918, HM Archive HV 293.

142 The Supervisory Board consisted of Alfred Weinschenk, Chairman, Alfred von Kaulla (Member of the Board of Directors of Württembergische Vereinsbank, Stuttgart), 1st Deputy Chairman Dr Josef Helm, 2nd Deputy Chairman Ludwig Anderst, Member of the Imperial Council Franz von Buhl, Privy Councillor of Commerce Wilhelm Federer, Carl Leonhard, Chief Financial Officer Adolf Klett, Karl Koenigs, Wilhelm Merz, Eduard Schall, and Wilhelm Scipio.

143 Workplace rules for Spohn brothers' Portland cement plant in Blaubeuren, 08/04/1892, HM Archive ZWB 13/1.

144 Riepert, 1927 (as note 64), pp. 972–974.

145 Ibid.

146 Workplace rules for Spohn brothers' Portland cement plant in Blaubeuren, 08/04/1892, HM Archive ZWB 13/1.

147 Ibid.

148 Workplace regulations for Portland-Cementwerke Heidelberg-Mannheim-Stuttgart AG from 02/08/1923, p. 3, HM Archive ZWL 78.

149 Ibid., p. 4.

150 Riepert, 1927 (as note 64), pp. 981–983.

151 Arbeiterdemonstration in Leimen: Eine Erklärung (signed: Portland-Cement-Werke Heidelberg-Mannheim-Stuttgart Aktiengesellschaft F. Schott, F. Brans, Dr E. Schott), in the Heidelberger Neueste Nachrichten newspaper dated 10/02/1919, p. 8.

152 SPD Archive Leimen, minute book of the Leimen Social Democratic Citizens' Committee Members, minutes of the Citizens' Committee Meeting of 15/01/1913.

153 Arbeiterdemonstration in Leimen: Eine Erklärung (signed: Portland-Cement-Werke Heidelberg-Mannheim-Stuttgart Aktiengesellschaft F. Schott, F. Brans, Dr E. Schott), in the Heidelberger Neueste Nachrichten newspaper dated 10/02/1919, p. 8.

154 Dietmar Cramer et al, Von Menschen und Zement: Die Geschichte des Zementwerks Leimen, Der Heidelberger Portländer: Beiträge zur Unternehmensgeschichte und Unternehmenskultur 2, Heidelberg 2001, p. 100 f.; Unruhen in Leimen, in Heidelberger Tageblatt from 10/02/1919; Die Vorgänge in Leimen, in Heidelberger Neueste Nachrichten from 12/02/1919, p. 8; Die Vorgänge im Cementwerk Leimen, in Heidelberger Neueste Nachrichten from 13/02/1919, p. 8.

155 Unruhen in Leimen, in Heidelberger Tageblatt from 10/02/1919.

156 Die Vorgänge im Cementwerk Leimen, in Heidelberger Neueste Nachrichten from 13/02/1919, p. 8.

157 Workplace rules for Spohn brothers' Portland cement plant in Blaubeuren, 08/04/1892, HM Archive ZWB 13/1.

158 Register of cement plant workers who received potatoes from the local cement plant in October 1921, 22/11/1921, Burglengenfeld Town Archives 412/2–7.
159 Leimen plant Annual Report 1929, p. 27, HM Archive HV 127.
160 Ibid., pp. 28–29.
161 Ibid., p. 29. Boiler master Robert Schirm, master electrician Markus Mayr, master cooper Ludwig Grieshaber, master tinsmith Franz Knopf, and packing master Wilhelm Schönit died between 1916 and 1920.
162 Ibid., p. 79.
163 Ibid., p. 62.
164 Ibid., p. 54.
165 Der Spohn-Zement: Mitteilungen an die Gefolgschaft der Portland-Cementfabrik Blaubeuren Gebrüder Spohn AG, vol. 1, 31/12/1937, Blaubeuren, p. 4, HM Archive ZWB 13.
166 Curt von Grueber, Maschinenbau AG, Berlin-Lichterfelde to Dr Georg Spohn, 14/02/1931, HM Archive HV 355.
167 Der Spohn-Zement: Mitteilungen an die Gefolgschaft der Portland-Cementfabrik Blaubeuren Gebrüder Spohn AG, vol. 1, 31/12/1937, Blaubeuren, p. 5.
168 Ibid.
169 Leimen plant Annual Report 1929, pp. 2–3, 41–42, 55 f, HM Archive HV 127. The exceptionally cold months of January and February 1929 brought construction activity and shipping traffic on the Rhine, which was frozen over from 04/02/1929 to 12/03/1929, to a complete standstill. Production was suspended from 21/12/1928 to 02/04/1929, which meant that export orders had to be cancelled. The shortfall in shipments in southern Germany amounted to 10,178 wagons.
170 Ibid., pp. 22, 26 f., 53–55.
171 Otto Heuer was a member of the Keppler Circle, a group of industrialists also known as Freundeskreis Himmler due to its close association with Heinrich Himmler. Cf. Tobias Bütow and Franka Bindernagel, Ein KZ in der Nachbarschaft: Das Magdeburger Außenlager der Brabag und der "Freundeskreis Himmler", Cologne 2003.
172 Special minutes of the meeting of the Supervisory Board, meetings of the "inner circle," 16/10/1918–27/03/1931, HM Archive HV 1161. In 1930, plant managers Carl Schindler and Wilhelm Friedrich resigned from the managing board.
173 Leimen plant Annual Report 1929, pp. 22, 26 f, 53–55, HM Archive HV 127.
174 Ibid.
175 Volksgemeinschaft, 05/05/1933.
176 Ibid.
177 Volksgemeinschaft, 09/05/1933.
178 Annual Report of the Portland-Zementwerke Heidelberg AG 1932, Report of the Managing Board dated 17/05/1933, HM Archive HV 20.
179 Annual Report of the Portland-Zementwerke Heidelberg AG 1934, Report of the Managing Board dated 30/04/1935, HM Archive HV 29.
180 Monthly technical report, March 1936, 11/04/1936, HM Archive ZWBL 193.
181 Monthly technical report, May 1936, 19/06/1936, HM Archive ZWBL 193. On 29 February 1936, a company roll call took place at 9 a.m., at which party member Bayreuth Döll spoke for the regional administration of the German Labour Front. Cf. Monthly technical report, February 1936, 10/03/1936, HM Archive ZWBL 193.
182 Works regulations for the Leimen plant dated 01/04/1938, pp. 7–8, HM Archive ZWL 78.
183 Annual Report of the Portland-Zement-Werke Heidelberg Aktiengesellschaft for 1939, Report of the Managing Board dated 25/04/1940, HM Archive HV 28.
184 Ibid., pp. 1–4, 16.
185 Works regulations for the Leimen plant dated 01/04/1938, p. 3, HM Archive ZWL 78.
186 Workplace regulations and Articles of Association of the provident fund of Portland-Zementwerke Heidelberg AG from 01/05/1940, p. 10, HM Archive ZWL 78.
187 Ibid.
188 Ibid.
189 Ibid., pp. 17, 21.
190 Werden und Wirken: Aus den Aufzeichnungen des Kommerzienrats Dr.-Ing. e.h. Carl Schwenk, Ulm a.D., Ulm 1939, p. 84.
191 Der Spohn-Zement: Mitteilungen an die Gefolgschaft der Portland-Cementfabrik Blaubeuren Gebrüder Spohn AG, 30/04/1938, vol. 2, p. 4, HM Archive ZWB 13.
192 Der Spohn-Zement: Mitteilungen an die Gefolgschaft der Portland-Cementfabrik Blaubeuren Gebrüder Spohn AG, vol. 1, 31/12/1937, Blaubeuren, p. 3, and letter from Dr Georg Spohn and Friedrich Kirchhoff to Otto Heuer, 27/07/1936, HM Archive HV 356.

193 Dietmar Cramer, Eine Fabrik verschwindet: Die Geschichte und das Ende der Portland-Cementfabrik Blaubeuren, Der Heidelberger Portländer: Beiträge zur Unternehmensgeschichte und Unternehmenskultur 1, Ulm 2001. Dietmar Cramer, Seit wann und wofür - Zur Geschichte der Kalksteinnutzung auf der Alb, in Wilfried Rosendahl et al (ed.): Das weiße Gold der Alb. Zur Natur- und Kulturgeschichte des Weißjurakalksteins, Stuttgart 2010, pp. 35-40; Dietmar Cramer, Kalkstein mein täglich Brot - Die Arbeit im Kalkstein von gestern bis heute, in Wilfried Rosendahl et al (ed.): Das weiße Gold der Alb. Zur Natur- und Kulturgeschichte des Weißjurakalksteins, Stuttgart 2010, pp. 41-45.

194 Letter from the South German Cement Association to Friedrich Kirchhoff, 06/09/1932, and letter from Dr Georg Spohn and Friedrich Schott to Dr Friedrich Kirchhoff, 26/08/1932, HM Archive HV 356.

195 Eberhardt Spohn, Die Portland-Cementwerke Heidelberg-Mannheim-Stuttgart AG (essay), n.d. [ca. 1965], HM Archive HV 494. The joint-interest agreement stipulated the exchange of three Heidelberg shares for one Spohn share, which was executed on 1 March 1939. 920,400 Spohn shares at 400 marks each were exchanged for 2,771,200 Heidelberg shares at 400 marks each. With share capital of 2,000,000 marks, Heidelberg's shareholding increased from 42.82% to 46.02%, and that of the Spohn family to 88.9%. Of the outstanding shares, a further nominal 144,400 Spohn shares (7.22%) were exchanged between 1942 and 1944, giving Heidelberg 96.12%. All of the remaining shares were bought up in the following years.

196 Joint-interest agreement between Portland-Zementwerke Heidelberg and Portland-Cementfabrik Blaubeuren, 10/12/1959, HM Archive HV 356.

197 Albrecht, 1991 (as note 134), p. 200.

198 Ein halbes Jahrhundert Zementwerksgeschichte in Burglengenfeld, in Factory reports, vol. 1, 1963, pp. 2–5.

199 Monthly technical report, April 1940, HM Archive ZWBL 193.

200 Monthly technical report, May and June 1940, HM Archive ZWBL 193.

201 In September 1944, 33% of the labour force in the German economy was made up of the categories prisoners of war, foreign workers, and concentration camp prisoners. At the Leimen location on 24 October 1944, the proportion was 35%, with no concentration camp prisoners employed. The proportion of female workers among the foreign civilian employees in the German Empire amounted to one third; in Leimen the proportion was 38.8%. On 16 March 1945, 6 Frenchmen, 45 Italians, 30 so-called Eastern workers from occupied Central and Eastern Europe, and 8 Dutchmen were still employed at the Leimen location. In the last weeks of the war, hectic relocations brought about a continuous reduction of the workforce. For example, on 19 March 1945, 37 Italians and 3 Germans were transferred to work on the railways, cf. HM Archive ZWL 379.

202 Meeting minutes: Hemscheidt and Schmidhuber with Managing Board members Kellerwessel, Koch, Scheck, 03/06/1942, HM Archive ZWB 69.

203 Ibid.

204 Request for prisoners of war from the Heidelberg Labour Office, 27/06/1942, HM Archive ZWL 379.

205 Ulrich Herbert (ed.), Europa und der "Reichseinsatz": Ausländische Zivilarbeiter, Kriegsgefangene und KZ-Häftlinge in Deutschland 1938-1945, Essen 1991, p. 12.

206 Annual Report of the Portland-Zement-Werke Heidelberg AG for 1933–1945, HM Archive HV 21 to HV 33.

207 Annual Report of the Portland-Zementwerke Heidelberg AG 1943, HM Archive DS 2335.

208 Letter from Paul Hemscheidt to Dr Josef Kellerwessel, 13/07/1944, HM Archive HV 357.

209 Annual Report of the Portland-Zementwerke Heidelberg AG 1944, HM Archive DS 2336.

210 Memo from Bohmann and Scheer/ headquarters to Burglengenfeld plant management, 02/11/1945, HM Archive ZWBL 323.

211 Der Heidelberger Portländer. Portland-Zementwerke Heidelberg Aktiengesellschaft works magazine, special issue for the 75th birthday of Dr Ehrhart Schott, 1954, p. 3, HM Archive DS 41.

212 Ibid., special issue 1960.

213 Ibid., special issue 1954, p. 4.

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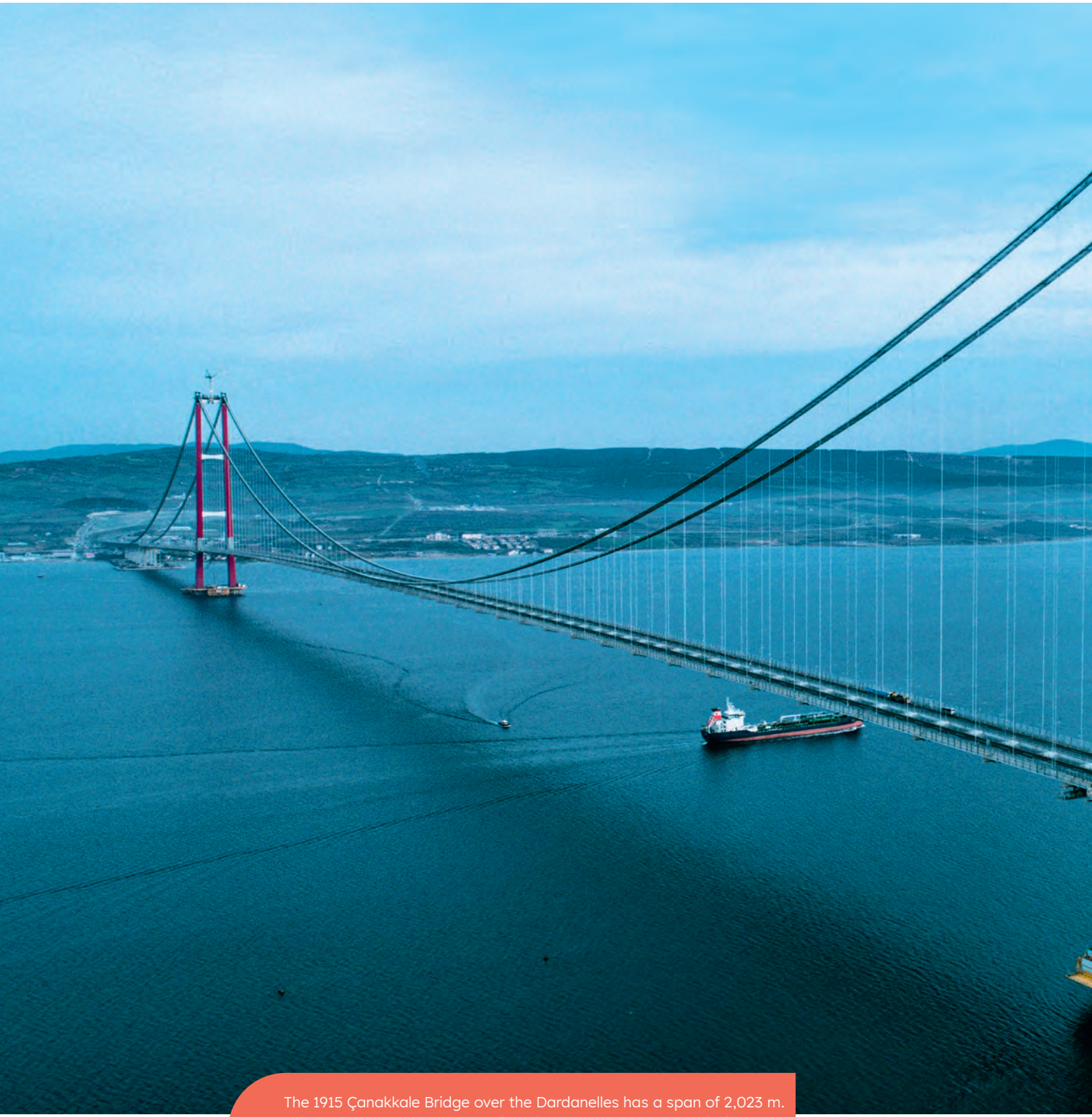

The 1915 Çanakkale Bridge over the Dardanelles has a span of 2,023 m. It is the longest suspension bridge in the world and was built from the special concrete “Betonsa 1803” by Heidelberg Materials, 2021.
Photo: Akçansa

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