Talk given by Geheimrat Alexander Wacker before distinguished guests in May 1913:

» We are occupied with the construction of a large industrial complex in southern Bavaria, with the aim of supplying a big range of products covering applications from electrothermics through to organic chemistry. «

Letter of thanks sent by the Göttinger Association’s chairman and head of Bayerwerk’s supervisory board, Dr. Henry Theodor von Boettiger:

» His Excellency Count Zeppelin, on the one hand, and your good self, esteemed Geheimrat, on the other, have described to us further ways of mastering nature’s forces that would have been considered impossible only two to three decades ago. «

Courage, Expertise and Far-Reaching Vision were the characteristics that Dr. Peter-Alexander Wacker, great-grandson of the company’s founder, embodied when he launched Wacker Chemie on the stock market on April 10, 2006 and, as CEO, assumed responsibility for the family-owned business. The IPO created a sound majority for the owning family and has since then guaranteed the company’s independence.

First in his capacity as CEO, and then as Supervisory Board chairman from 2008, Peter-Alexander Wacker has been a decisive force in shaping the development of a global company with Bavarian roots.

Courage, Expertise and Far-Reaching Vision are characteristics that Rudolf Staudigl, a doctor of chemistry, has demonstrated for over 30 years within the WACKER Group. He started out in managerial positions at the Siltronic division and became a member of Wacker Chemie GmbH’s board of management in 1995. On becoming CEO of Wacker Chemie AG in 2008, he has been instrumental in advancing the company’s sustainable growth: Today, WACKER not only operates its own integrated production sites in all the major international chemical markets, but has also set up application-driven technical centers and the WACKER ACADEMY across five continents.

For a century now, stable conditions and adaptability have fueled an enduring passion for quality and innovation that – as a legacy from the founder – still lives on in the creativity of the company’s employees in every corporate sector – in management, in the laboratories and at sites all around the world. « Dr. Peter-Alexander Wacker
It’s the people that give a company a face. Over the last 100 years, thousands of highly qualified and dedicated employees have made Wacker Chemie what it is today. As a typical cross-section of our employees and their inquisitive and inventive spirit, we introduce ten pioneers who have shaped WACKER through their trailblazing R&D.

Dr. Walter Hafner
invented the direct oxidation of ethylene with air to obtain acetaldehyde. His invention became known in chemical textbooks as the 2nd WACKER Process. He thus helped Wacker Chemie create the basis for the modern petrochemicals industry.

Dr. Eduard Enk
pioneered the development of hyperpure silicon technology and was a co-founder of Chemtronic (today’s Siltronic). He thus created one of Wacker Chemie’s key future business areas.

Dr. Franz Xaver Schwäbel
His work set new standards in crop protection, optimizing hop growing and viticulture. For decades, Dr. Schwäbel was a household name among hop farmers and viticulturists, and the name WACKER became a byword for pre-harvest crop protection.
Dr. Willi O. Herrmann was one of the very first WACKER pioneers, and his influence continues to be felt – he developed a number of methods still in use today.

Dr. Eugen Galitzenstein conducted in-depth research on acetic acid and developed innovative methods for its production – to this day, acetic acid remains an important base material in chemical processes.

Dr. Martin Murgdan was a founding member of the “Consortium” R&D facility, making a crucial contribution to all the research being conducted at that time – such as the production of acetaldehyde from acetylene and water, known as the 1st WACKER Process.

Dr. Herbert Berg developed the suspension polymerization process for vinyl plastics – his innovation was a vital engine that helped WACKER grow into a global company.

Dr. Max Ivanovits was inspired by instant coffee to come up with a groundbreaking innovation: dispersible polymer powder. This pioneering idea remains a crucial requisite on every building site.

Dr. Siegfried Nitzsche advanced R&D work in silicones and was in charge of the highly successful silicones division; today, WACKER is a global market leader, with a portfolio of some 3,000 silicone products.

Dr. Paul Askenasy used calcium carbide as a basis for developing methods (since patented) for producing chlorinated hydrocarbons, which were the precursors of well known products such as WACKER’s Tri and Per solvents and cleaning agents.
THE FUTURE
starts TODAY

WHAT WILL TOMORROW’S WORLD BE LIKE?
We don’t read the tea leaves or consult crystal balls. Instead, we consult our researchers and interpret the results of their work. Then we systematically steer their best ideas in the right direction. That way, good ideas turn into genuine innovations. AND THE BEST WAY TO ACHIEVE SUCH A GOAL: Methodical research and development.

WACKER Innovations
www.wacker.com/innovations
1 raw material for over 3,000 silicone products

50,000 metric tons of silicon in a year

99.999999999% purity

drop in energy consumption

a wafer-thin precision film made from 100% silicone

3,000 °C resistant to temperatures up to 300 °C

every metric ton of polysilicon in a solar module saves 6,000 tons of CO₂ emissions

1 in 4 solar panels worldwide use hyperpure silicon from WACKER

6,000 every metric ton of polysilicon in a solar module saves 6,000 tons of CO₂ emissions
Thanks to humble instant coffee, Dr. Max Ivanovits came up with a groundbreaking idea: dispersible polymer powder!

Innovation can be so simple.
On July 2, 1957, WACKER produced the first **13.2 metric tons** of dispersible polymer powder in its PVC dryer in Burghausen. The success of this world premiere literally caused a stir in the construction industry: this was the first time ever that a free-flowing dispersible polymer powder had been manufactured – by spray drying. WACKER is now a global market leader that supplies a variety of VINNAPAS® powder grades.
A MILESTONE in INDUSTRIAL APPLICATIONS VINNAPAS® DISPERSIONS

The development of VINNAPAS® H 60, a poly(vinyl acetate) dispersion for wood adhesives, saw WACKER revolutionize the world of industry in 1938.

The breakthrough came some 20 years later, with the development of vinyl acetate-ethylene (VAE) dispersions in 1960. By virtue of their copolymer structure, these products do not need any further additives, such as plasticizers. In consequence, this type of dispersion represents an environmentally sound and user-friendly solution that is increasingly superseding alternative technologies.

75 years after its initial development work, WACKER supplies a truly diverse range of VINNAPAS® dispersions for construction chemicals, paints, adhesives, plasters, textiles, nonwovens, carpet and paper coatings – and is a market and technology leader worldwide.
SILRES® BS SILICONE RESIN PRODUCTS

How can buildings save energy? Long before energy efficiency became a global issue, our laboratories had developed a trailblazing coating technology – silicone resin products. Developed in 1963, SILRES® BS products are as repellent to water as they are permeable to water vapor. They first hit the big time in the 1990s. SILRES® BS provides facades with reliable protection against moisture without reducing their water-vapor permeability. This prevents undesired heat loss and the associated adverse effects on a building’s energy consumption. SILRES® BS protects buildings against driving rain, thus extending the time between renovations – for at least 25 years.
LITTLE PELLETS WITH A LARGE EFFECT: GENIOPLAST® PELLET S

Can a single silicone additive optimize a wide range of thermoplastic compounds? GENIOPLAST® Pellet S can. The first silicone additive for plastics in pellet form facilitates the production and processing of thermoplastic molding compounds. At the same time, it enhances the surface quality of plastic articles made from molding compounds. The WACKER product is even approved as an additive for food-contact plastic materials (GENIOPLAST® Pellet P Plus). One silicone additive is enough to optimize all these different composites – a stroke of genius!
How does one product generate thousands more? The answer is silicon.

Silicon is one of WACKER’s two key raw materials. And this element is used as a basis for over 3,000 different silicone products. Silicone resins, silicone rubber, silicone fluids and various other specialty silicones enhance products and processes relating to key industries such as the automotive, life-science and wind-energy sectors. WACKER also supplies an ultrapure form of silicon: hyperpure polysilicon for solar and photovoltaic applications.

Backward integration is the key to trailblazing innovation and production. By acquiring a captive silicon facility in Kyrksæterøra near Holla, Norway, on July 1, 2010, WACKER made an important strategic decision: Backward integration within the raw material chain enhances supply security for silicon. Every year, 50,000 metric tons of silicon is produced in a continuous process, and is mainly used at WACKER’s sites in Nünchritz and Burghausen.
SMART SOLUTIONS: WAFERS FOR THE SEMICONDUCTOR INDUSTRY

Thanks to the development of application-specific silicon wafers, we provide our customers with an essential basic product. Polysilicon is the starting material for electronic devices of ever higher performance that are needed in modern computers, smart phones, and automation and energy-supply control systems.

Annual output of 50,000 metric tons

99.999999999 % purity

TECHNOLOGY IN ITS PUREST FORM: POLYSILICON

What has a purity of 99.999999999%? Hyperpure silicon from Wacker Chemie. We produce hyperpure polysilicon to high quality standards with an integrated quality management system. WACKER applies the experience gained from decades of polysilicon production for semiconductor electronics to the still relatively recent solar sector. It is therefore the perfect raw material for solar and photovoltaic applications. After all, hyperpure polysilicon is vital for sustainably increasing the efficiency of renewable energy supplies – energy sources which ensure that industrial processes minimize resource consumption and have a low environmental impact.
HANDS-ON PRECISION:

100% SILICONE FILM

Everything is possible. And our new ELASTOSIL® silicone film is the best proof. This innovative 100% silicone film has such specialized characteristics, and yet is so versatile that not even our silicone experts can list all its possibilities. Rather, they work with WACKER customers to devise tailored products and solutions in line with their individual applications, discovering new potential again and again. With its unique property profile, the wafer-thin high-precision film opens up entirely new applications and opportunities. That much is certain.
A SHINING EXAMPLE OF LEADING THE WAY: LUMISIL®

LUMISIL® SILICONES ARE AN ABSOLUTE HIGHLIGHT FOR OPTICAL APPLICATIONS. This is particularly the case when the focus is on high transparency and heat resistance. The cured liquid silicone grades allow visible light to pass through almost unhindered and easily withstand prolonged exposure to temperatures of up to 180 °C. In combination with light emitting diodes (LEDs), entirely new designs and housing styling are possible. These silicones are consequently the material of choice for manufacturing lenses and other optical elements such as headlamps.

LUMISIL® Product Overview
www.wacker.com/lumisil
Algae are an extremely versatile natural product and a key basis of biogenic processes in the pharmaceutical, cosmetic and food sectors. The ability of algae to photosynthesize broadens their versatility even more; to be precise, they can produce biomass – and do so with even greater efficiency than higher plants. Very specialized tubes of highly transparent, flexible ELASTOSIL® silicone rubber offer an excellent alternative, making the processes even more efficient. These tubes replace the glass tubes conventionally used in algal generators. The idea behind it was the result of a joint technology project between WACKER’s Engineering Silicones Tech Center in Burghausen and the Dresden-based Gicon Group.

Faster, higher, farther – automotive products must be pushed to the limit and demonstrate peak performance at all times. Yet things are getting hotter not only in the engine compartment, but in many other industrial sectors as well. A material that always keeps its cool is ELASTOSIL® silicone rubber. Thanks to its high thermal stability up to 300 °C, flexibility and durability, this rubber grade gives products a perfect head-start for market success.
DISPENSING WITH ANIMAL- DERIVED RAW MATERIALS: METABOLIC ENGINEERING

Metabolic Engineering can be used to manufacture a great many products from renewable raw materials enzymatically and reproducibly, offering many advantages. For example, cysteine bioengineered in this way does not require any human or animal raw materials. This permits kosher, halal and vegetarian-grade applications, for example, in the food industry (aromas and flavorings) and in the pharmaceutical sector (expectorants).

THE MAGIC OF THE MOLECULAR ICE-CREAM CONE CAVAMAX® CYCLODEXTRINS

Cyclodextrins are ring-shaped degradation products of starch and enable the molecular encapsulation of substances such as bitter flavors, vitamins and essential oils. This opens up a constant stream of new applications in the life-science, pharmaceutical and construction sectors. WACKER is the only company in the world to manufacture all three natural cyclodextrins – Alpha, Beta and Gamma. They can stabilize, for example, aromas and vitamins, mask undesirable odors and increase the bioavailability of active ingredients.
THINKING AHEAD: SUSTAINABLE MANAGEMENT

SUCCESS TODAY IS UNTHINKABLE WITHOUT SUSTAINABILITY. AT WACKER, SUSTAINABILITY IS NOT A TREND, BUT AN INTEGRAL PART OF CORPORATE PHILOSOPHY.

That is why sustainability at WACKER starts well before the factory gate, on the principle of “from cradle to gate.” Consequently, not only are our products sustainable, but so are the processes for making them. In our integrated production systems, we use by-products from one production step as starting materials for other products. The upshot is that our integrated production system:

- Significantly lowers energy and resource consumption
- Sustainably improves the availability of raw materials
- Greatly reduces waste

Integrated production is just one of WACKER’s sustainable solutions.

742 t CO₂ emissions saved annually

WACKER’s overall energy consumption dropped by 22% between 2007 and 2012

70% less energy is consumed at the Nünchritz production site than in 1999

PDF: Sustainability Report
www.wacker.com/sustainability
WACKER sees innovation as a crucial driving force for profitable growth in all business divisions. The high importance of innovations is deeply anchored in WACKER’s DNA, and coming up with innovations has always been an integral part of our entrepreneurial activity,” says someone who ought to know. Dr. Fridolin Stary heads Corporate Research & Development and is steadfast in his conviction:

“*You can only be innovative if you recognize new trends in society and on the market early on and welcome new and creative ideas. Thus, for example, our colleagues in marketing and sales are also called upon to recognize customer needs at an early stage and bring this knowledge to bear in the company.*” Dr. Fridolin Stary

WACKER is one of the most research-intensive chemical companies in the world. At 3.5% of sales, the innovation budget is very generous and provides an environment conducive to R&D activities. The R&D rate was 3.8% in 2012 and 3.9% in 2013. The company adopts a two-pronged approach to R&D:

At a central level, Corporate R&D does basic research, which can lead to the opening up of new business areas. For example, in silicon chemistry, in which WACKER is a global technology leader and driver of innovations.

Our business divisions conduct application-driven R&D, enhancing existing products and processes. Research at the divisional level is becoming increasingly international in outlook. For example, to tailor our construction chemicals to the specific needs of the Southeast Asian and Latin American construction industries.

Investing in the next generation of researchers: our commitment in the “Young Scientists (Jugend forscht)” reflects our dedication to encouraging young people’s interest in technology – safeguarding the next generation of scientists and engineers. 2014 is the seventh time that WACKER has sponsored the Bavarian state competition of “Young Scientists”.

Video: Paths to Innovation
www.wacker.com/research
Lighter-weight materials require less energy and are more efficient. The automotive sector, in particular, is turning the spotlight on light-weight construction methods. Researchers at WACKER can take advantage of this trend in various ways. For example as additives
• For special coatings based on carbon fibers. Carbon fibers do not normally bond to organic resins. However, functional silicone fluids as fiber coating can render them compatible;
• To increase the resin’s impact strength. GENIOPERL® core-shell particles, which consist of a silicone elastomer core and an organic shell, are already commercially available. They form the basis for further in-depth research in the category of materials known as “composites.”

Gas2Liquid converts surplus energy while minimizing resource consumption, thereby generating a new source of energy. Alternative energies generate a (non-controllable) surplus of power. One possible way to utilize and store energy is to produce hydrogen by electrolysis and by subsequent conversion into methane – which can be fed into the existing natural gas storage and distribution network.

If we succeed in substituting silicon for the carbon in the anodes of lithium-ion batteries, the battery storage capacity will increase. In theory, silicon can store 24 times as much lithium as carbon. The idea has not been put into practice in battery cells, however, because anodes that contain silicon endure far fewer charging/discharging cycles than conventional carbon. This is because, as lithium ions are inserted into the silicon and extracted again, it undergoes huge volume changes, which alter its properties. But the “Consortium” research facility is already working on elastic silicon structures that solve this problem. The chances of success look good, because WACKER’s internal areas of expertise with silicon, silicones, and polymers can be combined to produce an optimum solution to the conundrum. This expertise can be used to design batteries capable of storing two to four times as much energy as those currently available. A topic of relevance not only to smart phones and tablet PCs, but also to electric cars and the intermediate storage of solar and wind power.
When Dr. Alexander Ritter von Wacker founded Wacker Chemie in 1914, the world had a population of about 1.8 billion. 100 years later, 7.2 billion people in 194 countries across seven continents live on our planet. Advances at every level have seen the world coming ever closer together. Despite increasing globalization, however, every region and every person remains shaped by their individual culture and its traditions. This individuality must be reflected in products, as well. A polymeric binder formulated for construction applications in Germany will be different from one intended for the Vietnamese or Indonesian market. A silicone rubber product in India or China will face a different market from one in the USA.

OUR SPECIALISTS SPEAK THE LANGUAGE OF THEIR REGIONAL MARKETS

WACKER recognized the importance of a regional outlook for a successful product, and consequently for market success, early on when it established its first technical center in Burghausen. Today, customers benefit from being close to one of our 21 technical competence centers around the world. Our global network of native-speaker experts in local technical centers use regional raw materials to develop innovative products for their local markets. Precisely because they are locally based, our experts in silicones and polymers know the kind of applications that are in demand and which will be of potential interest in the future.
GLOBALLY UNIQUE SERVICE – THE TECH CENTER ENGINEERING SILICONES

Our largest applications technology facility is the Burghausen-based Tech Center Engineering Silicones, where we work with the same equipment, molds and processing technologies as our customers. Our solid and liquid silicone rubber grades enable us to cover a broad range of processes. Plus, we put highly tailored services at the disposal of customers. Our advice doesn’t stop with helping customers find the right materials for their individual applications – we also advise them on suitable processes, and on selecting appropriate machines and the right mold. In doing that, we work closely with our colleagues in the laboratory, in technical marketing, in technical support and with the sales manager responsible for that customer – that’s the person our customers always turn to first, explains Klaus Wenzeis, head of the Tech Center Engineering Silicones. The focus is on two demands, two processing technologies, extensive equipment – and a team of experienced experts which, incidentally, hasn’t changed since the center was established in 2000. This combination of features makes the Tech Center Engineering Silicones unique in the world and is the secret to its success.

REGIONAL PRIORITIES SET STANDARDS

All technical services focus on our customers’ individual requirements, taking account of locally available raw materials, prevailing climate conditions, as well as legal regulations and standards. This approach is used to improve existing customer formulations and develop new ones. Only state-of-the-art technical equipment is used for development, testing and optimization purposes.

Tech Center Engineering Silicones
www.wacker.com/technical-center
**HANDS-ON TRAINING**

**RESEARCH IS ALL ABOUT ASKING QUESTIONS.** How can facades be made more energy-efficient and so lengthen the time between renovations? Why do we need polymeric binders? How can silicone rubber replace conventional materials and increase efficiency? What role do silicones play in hair care, on building sites, and in home furnishings? Does e-business make you more successful?

How can you channel these and similar questions, while creating a knowledge-transfer platform? These are the very goals that WACKER ACADEMY is striving to achieve. Its unusual interdisciplinary training strategy combines theoretical and practical training with an exchange of experiences.

The first such academy was opened in Burghausen in 2007. It was initially known as VINNAPAS® ACADEMY, as it had a clear focus on construction chemicals. This unique idea quickly set standards: the seminars were expanded to include further key topics, and new sites were opened.

Today, 14 cities all around the world boast a WACKER ACADEMY campus – offering a varied program of seminars to participants in Europe, Asia, and North and South America. Expert trainers teach participants about theoretical aspects in a classroom environment, while practical tests are carried out in the lab. Collaboration is extremely important: Questions are asked, expertise is broadened and deepened, and new contacts are made. The courses are held in an international language or the participants’ native language.
SOMETIMES, WACKER ACADEMY GOES DIRECTLY TO THE PREMISES OF WACKER’S CUSTOMERS AND PARTNERS – OR DIRECTLY TO THE BUILDING SITE.

With the motto of “WACKER on Wheels,” a truck has been touring Vietnam since 2013. The converted truck contains a small-scale mobile training lab full of state-of-the-art equipment. In this way, WACKER demonstrates the benefits of modified dry-mix mortar applications such as tile adhesives, skim coats and waterproofing membranes compared to unmodified products. The live, on-location demonstrations are always impressive.
Providing assistance can be so easy. WACKER’s cent-donation program provides a solution! To participate in the program, employees agree to have their monthly salaries rounded down to the nearest euro. The difference goes to the company relief fund (WACKER HILFSFONDS) – and the company doubles the total amount contributed. Together about 4,200 euros is raised a month, with a total of some 50,000 euros every year.

Donating the Future

“That’s enough to cover the entire cost of running ten classes at the school in Kosgoda, paying teachers, and providing classroom materials and meals,” says a pleased Dr. Tobias O’Her, member of WACKER’s Executive Board. The school in the small village of Kosgoda in Sri Lanka was built straight after 2004’s devastating tsunami, which cost countless people their lives and laid waste to the coastline of Southeast Asia. WACKER employees were deeply moved, and in the aftermath, spontaneously collected 100,000 euros – which saw the birth of the WACKER HILFSFONDS (relief fund). Once the school had been rebuilt, the charitable foundation committed itself to financing the running of the school for five years. Soon, the school will be able to celebrate its tenth anniversary – the cent-donation program is a sound basis for its continued existence. In this way, a one-cent donation gives children in Kosgoda a future.

15-year-old Neranjala eventually wants to be a doctor. She is already a highly motivated student, likes working in a team and shoulders responsibility. Together with her sister and parents, Neranjala lives in Unesco Village.

Suranga is 13 and speaks excellent English. His language skills have even seen him win awards for debating.

Suranga lives with his parents, brother and sister in Unesco Village.

Video: WACKER Relief fund (DE)
www.wacker.com/relieffund
FACTS AS FIGURES

- 50 years of SILRES® BS silicone resin technology
- 500 million silicone cartridges
- 30 years of WACKER in Southeast Asia
- 120,000 metric tons of VAE dispersions per year
- 5,400 active patents
- 500 million silicone cartridges
- 43 years of WACKER in Latin America
- 5,400 active patents
- 49 years of WACKER in North America
- 21 years of WACKER in China
- 21 technical centers
- 21 years of WACKER in China
- 2,900 patent applications
- 16,000 employees
- 25 production sites
- 111 years of basic research
- 75 years of VINNAPAS® dispersions
- Employees from 70 countries
- 2 raw materials
- 5 continents
- 14 WACKER ACADEMY campuses
- 500 million silicone cartridges
EXPERTISE and SERVICE NETWORK ON FIVE CONTINENTS

WACKER is one of the world's leading and most research-intensive chemical companies, with total sales of € 4,478.9 million.

Products range from silicones, binders and polymer additives for diverse industrial sectors to bio-engineered pharmaceutical actives and hyperpure silicon for semiconductor and solar applications.

As a technology leader focusing on sustainability, WACKER promotes products and ideas that offer a high value-added potential to ensure that current and future generations enjoy a better quality of life based on energy efficiency and protection of the climate and environment. Spanning the globe with 5 business divisions, we offer our customers highly-specialized products and comprehensive service via 25 production sites, 21 technical competence centers, 14 WACKER ACADEMY training centers and 53 sales offices in Europe, North and South America, as well as in Asia – including a presence in China.

With a workforce of 16,000, WACKER sees itself as a reliable innovation partner that develops trailblazing solutions for, and in collaboration with, its customers. WACKER also helps them boost their own success. Our technical centers employ specialists who are native speakers of the local language and assist customers worldwide in the development of products tailored to regional demands, supporting them during every stage of their complex production processes, if required.

WACKER e-solutions are online services provided via our customer portal and as integrated process solutions. Our customers and business partners thus benefit from comprehensive information and reliable service to enable projects and orders to be handled fast, reliably and highly efficiently. Visit us anywhere, anytime around the world at: www.wacker.com
WACKER CHEMIE

100

A CENTURY CREATING TOMORROW’S SOLUTIONS