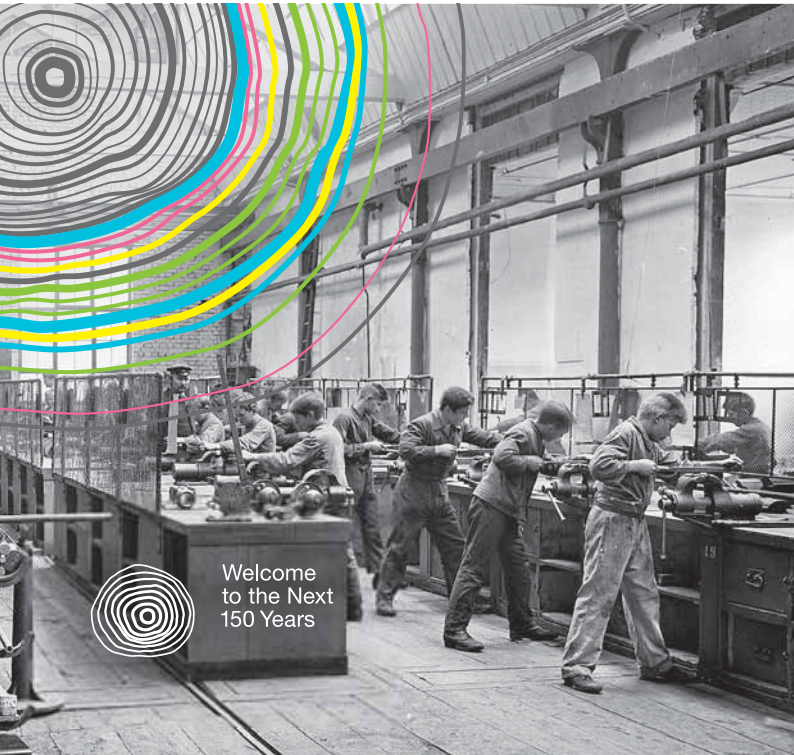
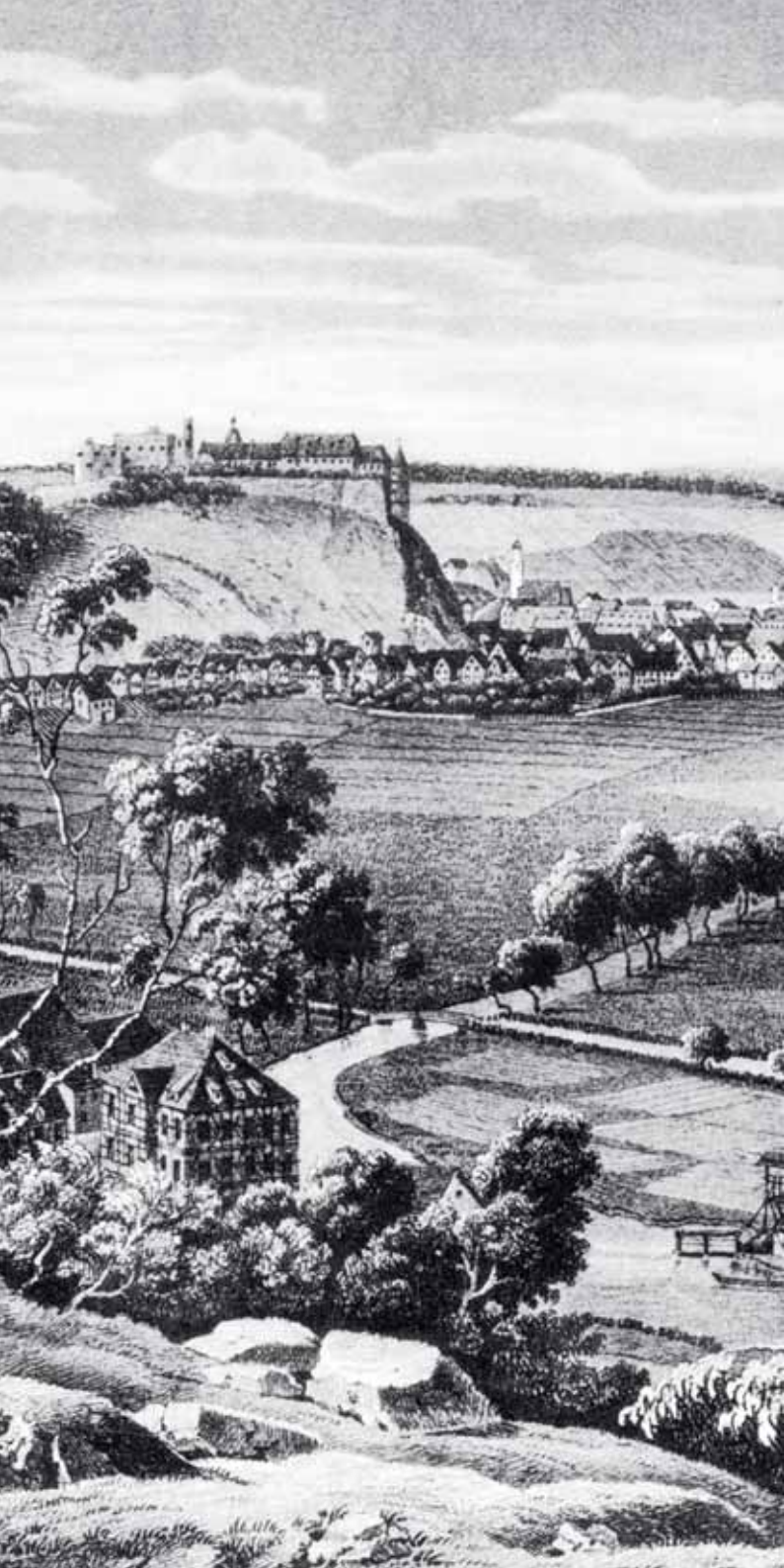
VOITH

Leading the Way with Good Ideas – Since 1867

The Voith History





Heidenheim at around 1860.

The first turbine test laboratory in Hermaringen on the River Brenz, built in 1907.

Contents

Why we took a closer look at the history of Voith …

There are no records of how many locksmiths' workshops existed in Germany in the middle of the 19th century. But one thing is pretty certain: only one of these workshops evolved into a globally active family-owned company with a current workforce of 19 000 employees and € 4.3 billion sales. Into a company with a 150-year-old tradition that contributes to growth and prosperity in the key industries of modern society.

What is the secret of this unique success story? What made Voith so special that, by the late 19th and early 20th centuries, its name was already highly respected, even in North America and China? And how did it become today's multi-diversified Group that is active in the markets energy, oil & gas, paper, raw materials, and transport & automotive?

In this booklet, we would like to ask ourselves what we can learn from the past for the future. We talk about our roots and what has characterized Voith during all these years. There are not many companies that get to celebrate their 150th anniversary. Our remarkable success story is interwoven with a number of central themes: long-term thinking and acting, responsibility towards our customers and part-

ners, the promotion of a pioneering spirit, open-mindedness, our commitment to the Voith values, and, above all, courage and creativity when it comes to innovations and investments. With the establishment of the new Group Division Voith Digital Solutions, we have once again demonstrated that we regard new trends as opportunities to develop our company even further.

To us, the past is not a closed chapter – instead it is an incentive to continue the success story of Voith with unremitting enthusiasm and energy. Therefore: Welcome to the next 150 years!

With best regards,

Dr. Hubert Lienhard, CEO and President of
Voith GmbH

Voith at the Beginning of the 21st Century

Voith is a globally active engineering group and a partner of key industries. With innovative solutions and high-end technology, the company contributes to the further development of industrial markets and thus also to acceptable living standards for millions of people in the world.

Electricity for light and heating, paper for education and communication, raw materials for industrial products, technologies for the digital age, mobility for millions of people and goods that are indispensable for living in the 21st century.

Voith creates the foundations for this, and serves the markets energy, oil & gas, paper, raw materials, and transport & automotive with its broad portfolio of plants, products, and digital solutions. One quarter of the energy generated worldwide from hydropower is produced with turbines or generators from Voith. Plants and components from Voith keep the oil and gas industry running. A large proportion of the world's paper production originates from Voith paper machines. Voith drive technology moves commercial vehicles on rail, road, and water. And Voith Digital Solutions focuses on the development of new digital applications and business models for mechanical and plant engineering.

Our markets:

1 Energy
2 Oil & Gas
3 Paper
4 Raw Materials
5 Transport & Automotive

At the beginning of the 21st century, more than 19 000 people in 60 countries work for the company. With its production sites, its research and development centers, and its service and marketing companies, Voith is today rooted in all regions of the world.

Voith is one of the large family-owned companies whose beginnings date back to the 19th century. Over a period of 150 years, the company has written engineering history, experienced far-reaching social changes, overcome world wars and economic crises, and still managed to grow steadily. With its new Group Division Digital Solutions, Voith will play a decisive role in the digital transformation of the machine and plant engineering markets. Voith is stronger, more diversified, and more international than ever, yet has always stayed true to itself.

Always One Idea Ahead

There is one aspect that has characterized Voith from day one: long-term, sustainable thinking and planning – often across generations. Voith has always managed to anticipate megatrends – and to develop the required technologies. In the past, this referred to the production of the raw material paper on an industrial scale, the breakthrough of electrification, and the progress of road and rail traffic; today renewable energies, unlimited mobility for people and goods, and resource-sparing production are on the agenda of modern economies – issues, into which Voith has been looking for quite some time.

Clean Energy from Hydropower

The world population is growing at a phenomenal pace. According to UNO estimations, 9.2 billion people will live on earth in 2050, 2.5 billion more than today. And they will live

1 Electricity from renewable energy sources.

2 Raw material recycling.

in a world with significantly higher levels of industrialization and prosperity. All of them need to be supplied with energy that is generated in a way that is as environmentally friendly and sustainable as possible. Hydropower will play a decisive role in the development and restructuring of energy supplies for economies all over the world.

In emerging markets such as India, China, and Brazil, large hydropower stations provide electricity for growth and social welfare – while remaining climate-friendly, reliable, affordable, and predictable. Voith participates in large hydropower plant projects all over the world.

Voith engineers develop innovative solutions also for countries in central Europe, where the natural potential for hydropower stations has long been exhausted. With the mini turbine StreamDiver it is now possible to generate power at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existing weirs that could not be utilized in the past. They support the Energy Transition – and pumped storage technology, once invented by Friedrich Voith, is its backbone.

New Concepts for the Paper Industry

With innovative solutions and systems, Voith is making a contribution to lowering environmental pollution – and to strengthening the position of its customers in an ever more competitive market. With the integrated paper mill EcoMill, new standards are set for resource-sparing paper production: Due to highly integrated sub-processes, the EcoMill principle ensures lower raw material, energy, and water consumption, as well as lower investment and operating costs – a contribution to sustainable developments that cannot be rated too highly, especially in rapidly growing emerging markets. In the field of tissue production, Voith engineers have also been writing engineering history. With ATMOS technology, it is possible for the first time to produce premium quality hygienic papers from 100 percent recycled paper and still save on fiber and energy.

Mobility for People

Cities are turning into urban centers that grow at an explosive rate. The year 2007 was the first time that the number of people living in cities exceeded that of people living in the country. According to UNO estimations, this percentage will rise to 70% by 2050 – out of a total population of 9.2 billion people. These people want to get from one place to another safely, fast and in an eco-friendly way. In the megacities, mass transit will play a vital role for individual mobility. Voith

1 Public transport in cities and conurbations.

2 Urbanization and growing mobility.

participates in the development of all required technologies and supplies systems for buses, urban railways, metros, and monorails. The Voith research centers are working on modern hybrid drives, waste heat recuperation systems, and a new generation of the Aquatarder SWR for commercial vehicles.

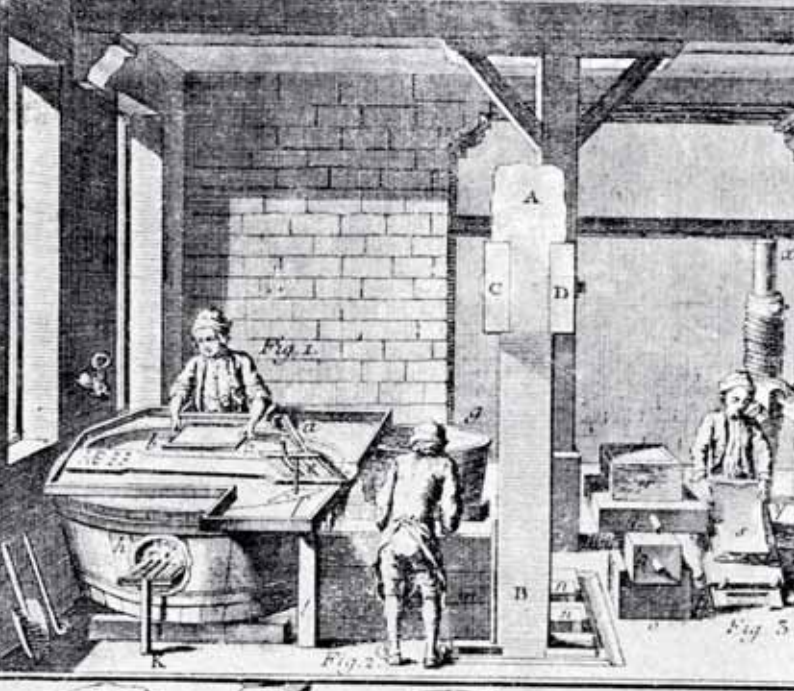
Solutions for the Digital Age

Digitalization and networking have changed our lives and the way in which we communicate with each other. These changes have an impact on all areas of our daily life. The real and the digital worlds keep growing together, modern information and communication technologies merge with industrial processes and thus progressively change the production landscape. It has always been our ambition to actively shape new developments in industry. The newly founded Group Division Voith Digital Solutions offers new concepts for IT and automation,

as well as for plant and mechanical engineering in the digital age. With this new Group Division, we will open up additional markets, create new sales opportunities and win new customers – and thus new prospects for the further growth of our company.

Deeply Rooted All Over the World

Voith has been globally active since the 19th century. At the beginning of the 21st century, it is the declared goal of Voith to be rooted in the Chinese, Indian, and Brazilian markets as deeply as it is rooted in Germany. Once Voith is regarded as a local company with German origins, it can make optimum use of its strengths. Voith therefore believes in high local value creation – and in local management teams who understand individual cultures, market conditions and requirements, and simultaneously live the Voith corporate values.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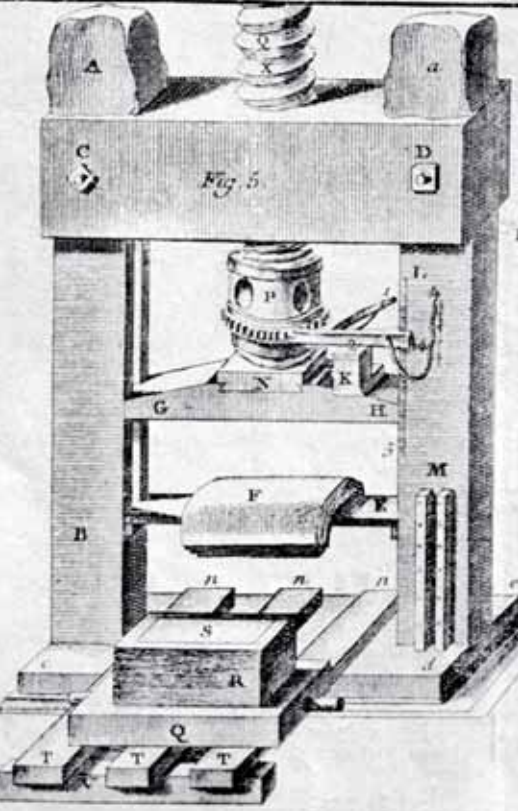
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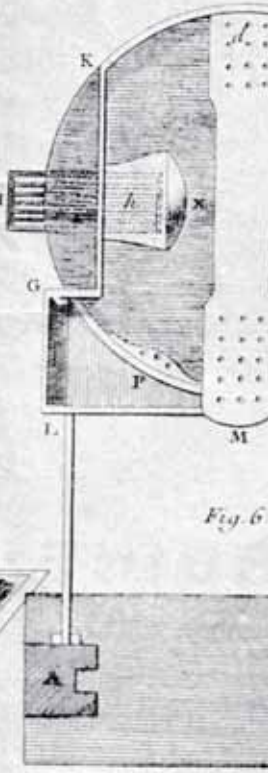
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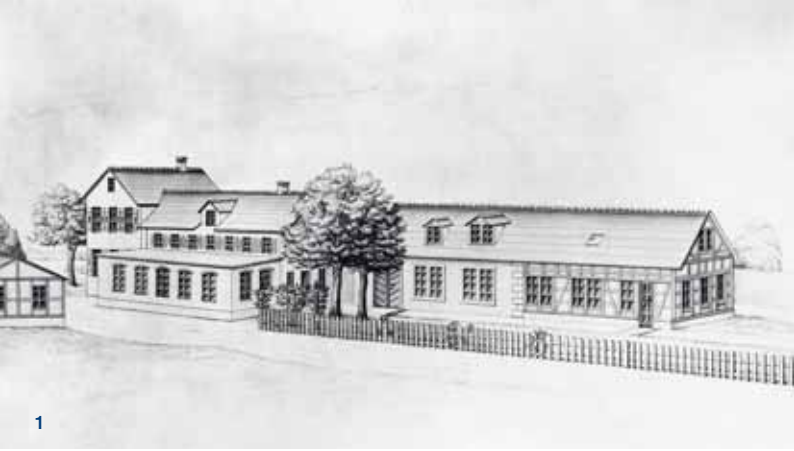
Paving the Way for a Success Story …

From a small Swabian locksmith's shop to a renowned machine works with 30 employees – Johann Matthäus Voith, father of the company's founder Friedrich Voith, has left a vital legacy to his son and therefore to Voith as a whole: innovative spirit and entrepreneurship.

It seems that Johann Matthäus receives the major impetus for his future-oriented thinking when he visits the Paris World Exhibition in 1855. As one of five locksmiths and mechanics from Württemberg, he is able to attend this forum of technical innovation thanks to a travel grant. His report to the Württemberg Center of Trade and Commerce indicates what conclusions he draws from the encounter with international industry. As he sees it, the end of small artisan workshops is imminent unless they start to operate with the latest and best machines on an industrial scale. In order to stand up to the superior competition from England, it is imperative to specialize through innovation and conquer the niches in the market. Pioneering spirit, innovative strength, and applied technology are the keys to boosting competitiveness. He is soon the best example for his analysis: With his very own development of a wood grinder, he becomes the pioneer of modern paper production.

Historic paper production workshop.



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1 The Schleifmühle workshop on the River Brenz.

2 Johann Matthäus Voith

3 The birthplace of Johann Matthäus Voith at Hintere Gasse in Heidenheim.

Spirit of Departure in Heidenheim

Johann Matthäus is 22 years old when he takes over the locksmith business from his father Johannes in Heidenheim in 1825. Three years earlier, the workshop had moved from the narrow Hintere Gasse address to the more spacious Schleifmühle premises on the River Brenz – still the headquarters of the company today.

Five workers assist the master craftsman in handling the orders from the mills, especially the paper mills, which are operated by water wheels. Voith also looks after the machines of the neighboring textile companies.

Johann Matthäus Voith (1803–1874)

- Qualified locksmith
- His small workshop in Heidenheim is the predecessor of the company that is later named after him in 1867

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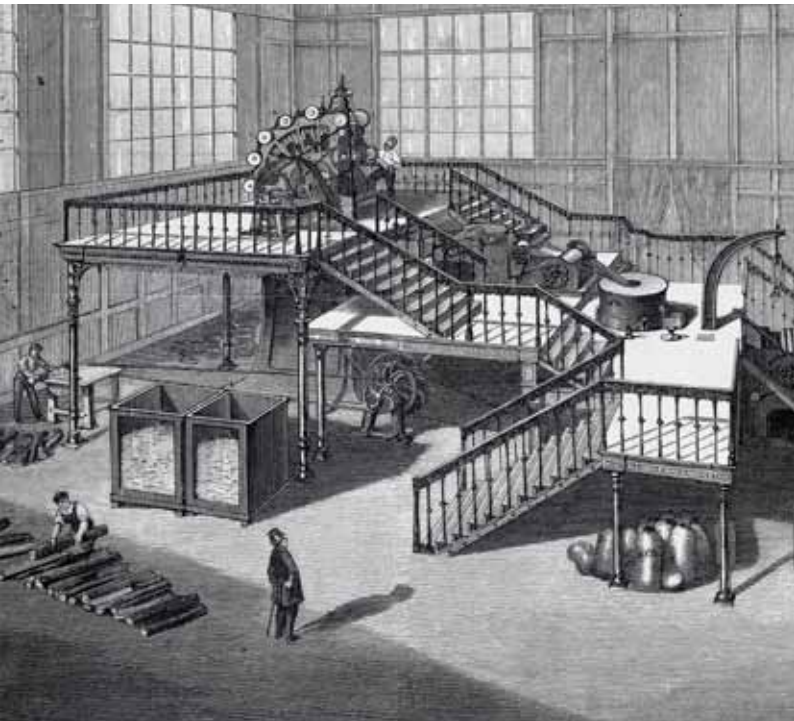
In the middle of the 19th century, the country is in a state of radical transformation. The Industrial Revolution is advancing, and also makes its mark on the Eastern Swabian Jura. Heidenheim experiences a rapid upswing, especially in the textile industry. This development hugely benefits from hydropower as a natural economic factor – which is needed for driving the machines in these pre-electric times.

Pioneer of Industrial Paper Production

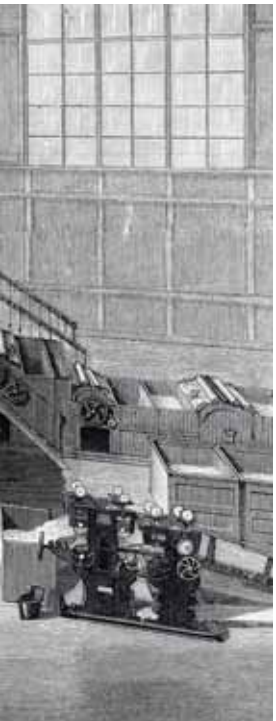
This spirit of departure also grips Johann Matthäus Voith. He is no longer satisfied with mending damaged water wheels. His true passion is the construction of entire systems. He

improves the design and the drives of imported machines. He delivers additional and spare parts for paper machines. And he begins to develop a wide range of machinery himself: spinning machines, an artificial wool machine, shredders, and even printing machines. At around the same time, the inventor and master weaver Friedrich Gottlob Keller discovers that paper can also be made from wood. Administration and commerce need larger and larger quantities of paper. At the time, it was customary to use old textiles such as rags and fabric waste as raw material for paper production. Yet in view of the rapidly rising demand, they are in short supply. By using wood as a raw material, paper could be produced on an industrial scale – because wood is available in abundance. Keller meets the Heidenheim papermaker Heinrich Voelter and sells him his patent. But the process is not yet mature enough for industrial production. Voelter's

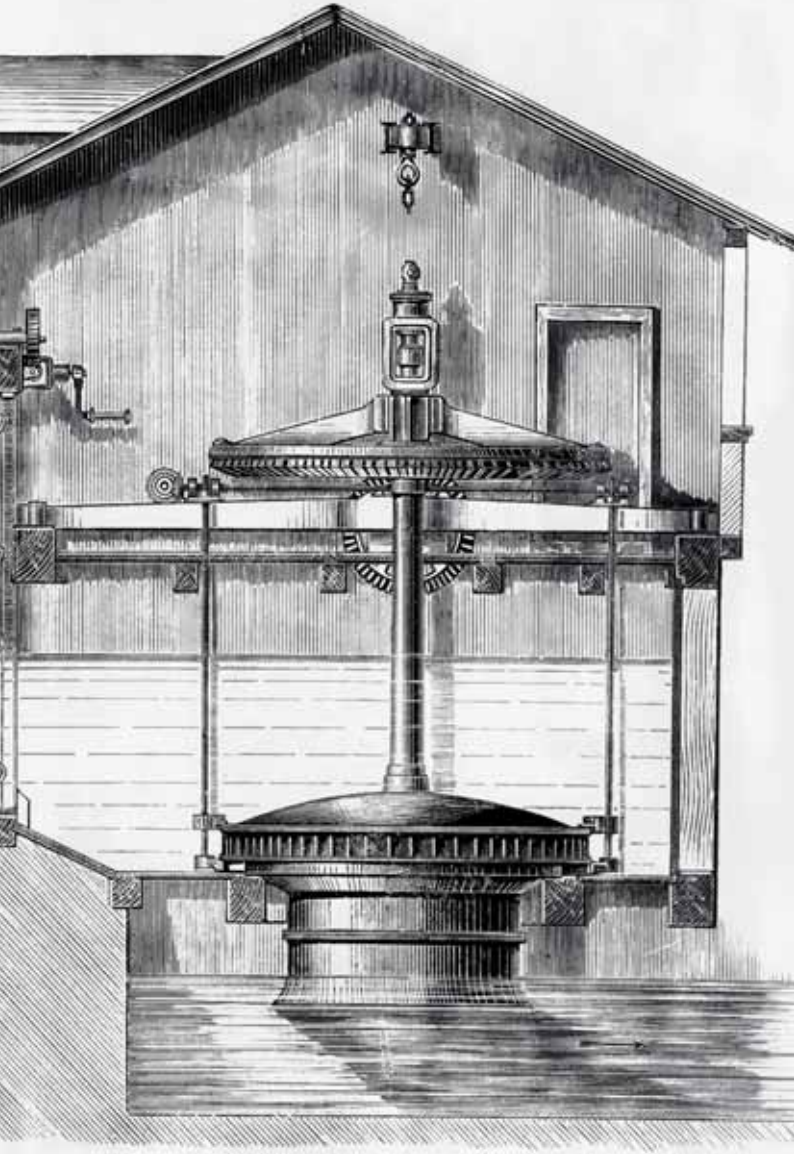


breakthrough eventually arrives after he cooperates with Johann Matthäus Voith. In 1859, the latter develops a wood grinding machine that makes it possible to grind wood into pulp, thus allowing high-quality paper to be produced at affordable cost. Johann Matthäus Voith writes technical history with this wood grinder. The way for industrial paper production is paved. Alongside the growing demand for paper, his company grows too. In view of a large number of orders for wood grinding machines, he continuously expands his workshop and turns Heidenheim into the cradle of the paper industry.

In 1867, Johann Matthäus Voith hands over a flourishing business with 30 employees to his son who joined the company in 1864: this marks the official foundation of today's Voith Group – and the start of a new era.



Voith wood grinder at the Paris World Exhibition in 1867.



How Good Ideas Turn Into Good Business …
1867–1913

The foundation of Voith in 1867 takes place at an eventful time. In 1871, Prussian King Wilhelm I is proclaimed Emperor of the German Empire, and Otto von Bismarck becomes the Empire's first Chancellor. Apart from a few interruptions, the country's economy thrives until the First World War. The advent of electricity results in rapid growth of heavy engineering: industrial centers begin to emerge and huge factories change the skylines of the cities.

Railways now operate throughout Europe. From 1864, Heidenheim, too, is connected to the trans-regional traffic network. The place develops from a rural community into a flourishing industrial town – not least thanks to Voith.

Voith Francis turbine in a powerhouse shaft. Power is transmitted by cogwheels.

Entrepreneurial Spirit in the Age of Promoterism

Alongside the continually growing proletariat, the "Gründerzeit" – the age of promoterism in Germany – also sees the development of an affluent and self-confident middle class. Friedrich Voith is the archetype of the ever-increasing number of aspiring entrepreneurs: The engineer and company proprietor is characterized by organizational talent, a passion for innovation, the willingness to take risks, open-mindedness, and a patriarchal approach. He will take his father's ideas further, thoroughly restructure the company, develop new business fields, expand abroad, and make the name Voith world-famous. He recognizes the developments that are appearing on the horizon and systematically focus Voith's business activities on these developments: Paper and energy are the megatrends in those days.

The advancement of electrification is largely accelerated by ideas of Voith – ideas that are now the backbone of the energy shift. Technical designs from Voith are also the basis for papermaking on an industrial scale – and for paper becoming a widely available mass-produced commodity. And because Voith can offer solutions that stimulate economy and society, Voith as a company grows, too – a correlation that still applies today.

Friedrich Voith (1840–1913)

- Son of Johann Matthäus Voith
- Engineer and businessman, trains at Stuttgart Polytech as a mechanic
- After his apprenticeship and time as a journeyman in several different companies, he eventually joins his father's workshop, which he takes over in 1867
- Paves the way from locksmith's workshop to globally active company and is awarded with numerous honorary titles

1 Friedrich Voith and his wife Helene.

2 Study of Friedrich Voith.

3 This historic contract from 1867 marks the official founding date of Voith.

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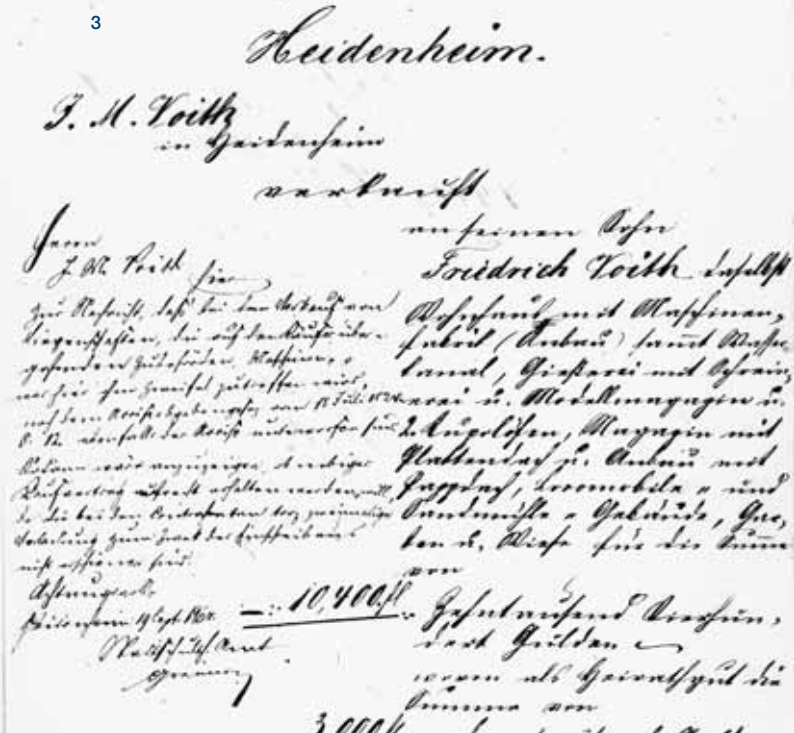

Heidenheim.

J. M. Voith
in Heidenheim

Friedrich Voith

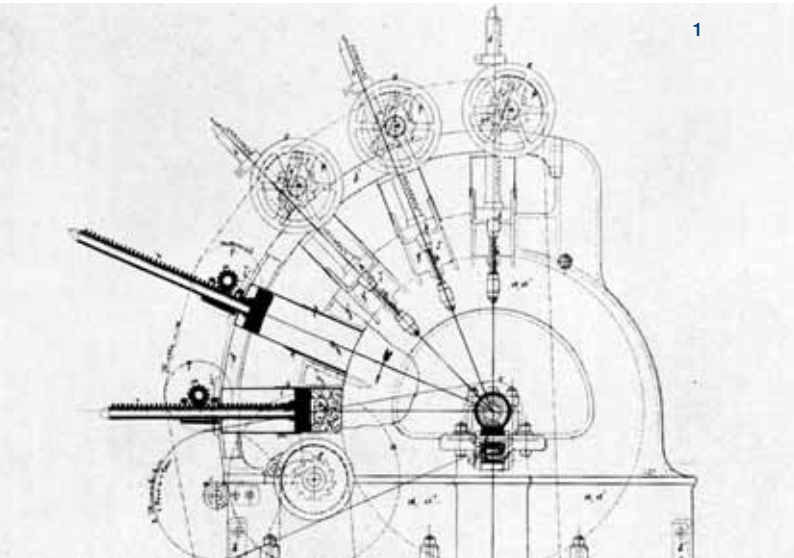
Courage and Vision

After completing his apprenticeship and working in various companies as a journeyman, Friedrich Voith joins his father's business in 1864 – by spontaneously accepting an order for eight "Hollanders" (a machine for refining paper stock). A bold move, because he has neither the required production halls nor the essential machinery for this project. Friedrich Voith expands the premises around the Schleifmühle, increases his workforce – and delivers the machines on time.

Johann Matthäus takes a somewhat reserved attitude towards his son's appetite for risk. He is open to experiments in technical matters, but extremely cautious when it comes to entrepreneurial decisions. The handover of the business to his son in 1867 marks the onset of a new era. Over the next few years, Voith sees rapid growth – and also expands abroad. It also becomes apparent that Friedrich's commercial bold-

1 Wood grinder: construction drawing for patent registration, 1869.

2 Wood pulper at the Vienna World Exhibition, 1873.



ness goes hand in hand with great vision. He demonstrates purposeful meticulousness when it comes to turning innovations into marketable products.

Paper is Patient – Friedrich Voith Is Impatient

The Industrial Age is also an era of information – although the ever-increasing flood of information is mainly distributed with the help of printed or hand-written papers. The prospering paper industry is the bedrock of the growing success of Voith as a company.

Friedrich Voith develops his wood grinding technology further and designs several special machines. In 1869, Voith is granted the first patent for a wood pulping machine, and many more patents are to follow. In 1873, Voith is awarded the “Progress Medal” at the Vienna World Exhibition for a wood grinding machine.

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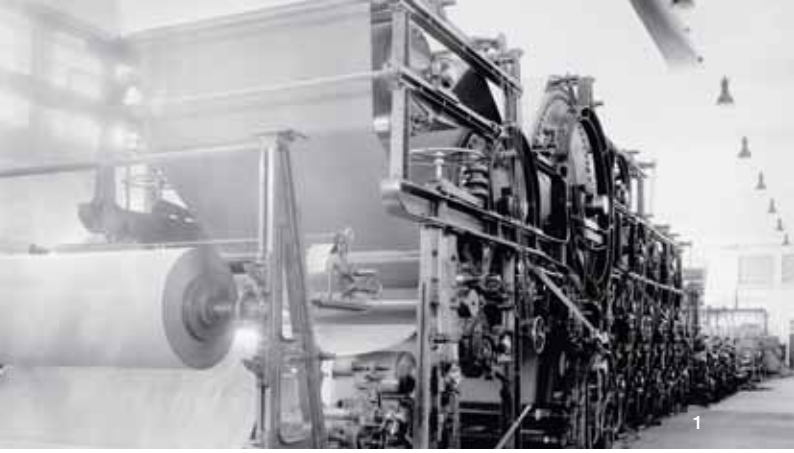

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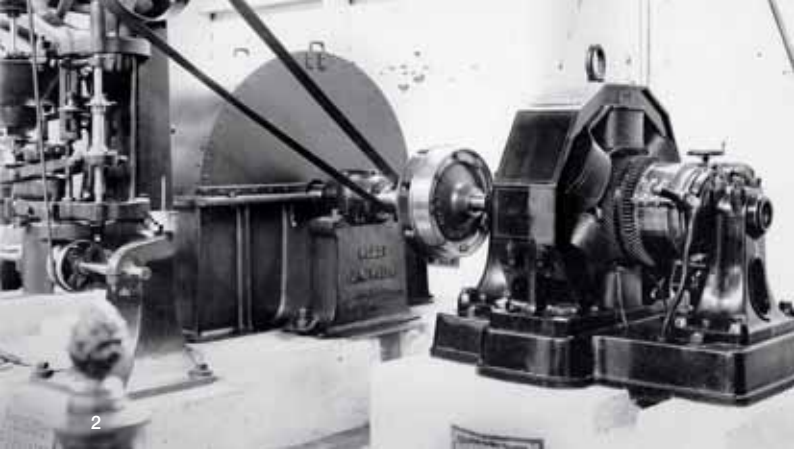
As an ambitious entrepreneur, Friedrich Voith no longer wants to restrict himself to producing individual components for papermaking. Voith now builds paper machines that process the raw materials into the final product. In 1881, Voith delivers the first complete paper machine to Raithelhuber, Bezner & Cie. in Gemmrigheim on the River Neckar (Germany). Over the following years, Friedrich Voith secures his position as a market leader in the paper machine sector by continuously expanding the product portfolio. Different operating widths, higher production speeds for paper machines, machines for producing newsprint, board and special papers – Voith supplies what the market demands.

Growth through Turbine Construction

"Specialize through invention and occupy market niches" – this was father Johann Matthäus Voith's mantra after his visit to the World Exhibition in 1855, and Friedrich Voith puts this principle into practice. He realizes that, alongside its growing demand for paper, Germany also has a massive appetite for energy. From the 1870s, the production of water turbines



1 Voith produces its first complete paper machine in 1881.

2 Voith Francis spiral turbine with “precision regulator.”

therefore becomes a second mainstay of the manufacturing program – a logical derivation from the core business. After all, as a producer of paper machines, which are mechanically driven by water wheels, Voith knows all about the fundamentals of this technology. Water wheels eventually evolve into water turbines – and become a key technology for electricity generation from hydropower. Voith thus turns into a leading pioneer of electrification.

The first turbine leaves the production halls in 1870. The company soon acquires a reputation as a specialist for hydropower. Voith turbines are always optimally suited for existing water volumes and heads. In 1873, Friedrich Voith reaches a milestone with the production of the first Francis turbine for the weaver C.F. Ploucquet in Heidenheim. Friedrich has recognized the revolutionary characteristics of this American invention, and enhances it to such a degree that it soon dominates the market. One of his improvements is, for example, the addition of movable guide wheels for controlling the turbine output.

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Electrifying Inventions

While the first turbines are primarily built to drive machines mechanically, the increasing electrification also results in a rising demand for water turbines for power generation. In 1879, Voith builds the first turbine controller, a pioneering innovation for producing electricity from hydropower. Electric power no longer has to be generated at the place where it is consumed – giving rise to the construction of power stations and overland high-voltage lines. The development of electrical machinery, the growing popularity of electrical engineering, and the emergence of huge power stations lead to an enormous demand for turbines – and enormous sales for Voith.

From Research to Development

Whoever wants to survive in industrial competition must be ahead of the pack with advanced technology: this is one of Friedrich Voith's fundamental beliefs. He therefore keeps close contact with science and research. Together with his friend Gottlieb Daimler, he experiments on coal dust engines. Heidenheim thus becomes an El Dorado for engineers.

1 Brunnenmühle Heidenheim: The turbine test laboratory and Germany's first pumped storage power plant enter service in 1908.

2 In 1879, Voith produces his first turbine controller.

The productive exchange with science and research results in the setup of numerous test laboratories. In 1908 Voith once again lives up to his reputation as an innovator with the erection of Germany's first pumped storage power station. Using inexpensive surplus electricity from the test laboratory, water is pumped into a storage basin overnight and used for driving the turbines on the following day. Voith has thus found a key technology for managing today's energy shift – because it allows storage of energy for future utilization.

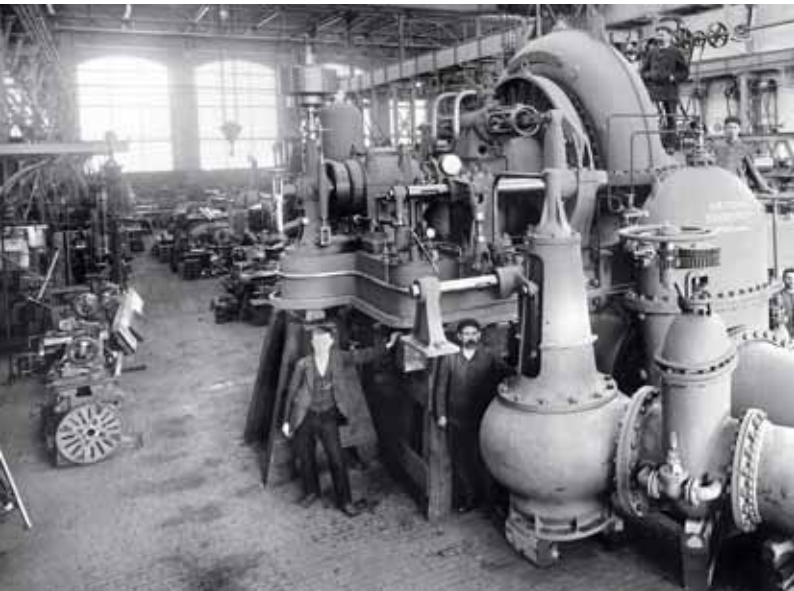
Overseas Countries Beckon

From 1893, Voith focuses more and more on overseas markets. A trip to America to the World Exhibition in Chicago in the company of other industrialists provides Friedrich Voith with the necessary contacts. Export – especially of turbines – becomes increasingly important for the company. In 1903, a spectacular contract attracts the attention not only of the business world: the power company at Niagara Falls orders twelve Francis turbines during the years 1903 to 1912, each rated at up to 12 000 hp, an output that had never before been achieved. Voith successfully fulfills the order – and becomes a worldwide synonym for technical competency and high-class workmanship.

Friedrich Voith now consistently invests into conquering lucrative markets. In 1908, he establishes the first overseas subsidiary in St. Pölten, Austria. From here, the Austro-Hungarian and the Russian markets are supplied with paper machines. In 1906, Voith gets its first major order from far-away China. The company is to produce the turbines for the first Chinese hydropower station in Shi Long Ba (Yunnan Province). They are delivered four years later. Step by step, the Swabian factory Voith becomes a global company.

Investments in Machinery – and Brainpower

The growing product diversity and ever-rising machine dimensions call for more and more expansion of Voith's production capacities. The mechanical workshop becomes a huge factory. During this time, the company's built-up area increases nearly nine-fold.



And since Friedrich Voith is convinced that quality products can only be manufactured by a thoroughly trained team of qualified workers, he also invests in the education of the next generation of employees. As early as 1910, he establishes the first training workshop. The social benefits granted by Voith are equally progressive for their time. While most plants in Germany have just reduced their daily working hours to eleven and started to pay for overtime, the ten-hour day has long been established at Voith.

When Friedrich Voith dies in 1913, he leaves a thriving engineering company to his sons. Under his auspices and due to innovative thinking, prudent planning, and bold entrepreneurial decisions, the workshop with its staff of 30 has become an export-oriented global company with some 3 000 employees.

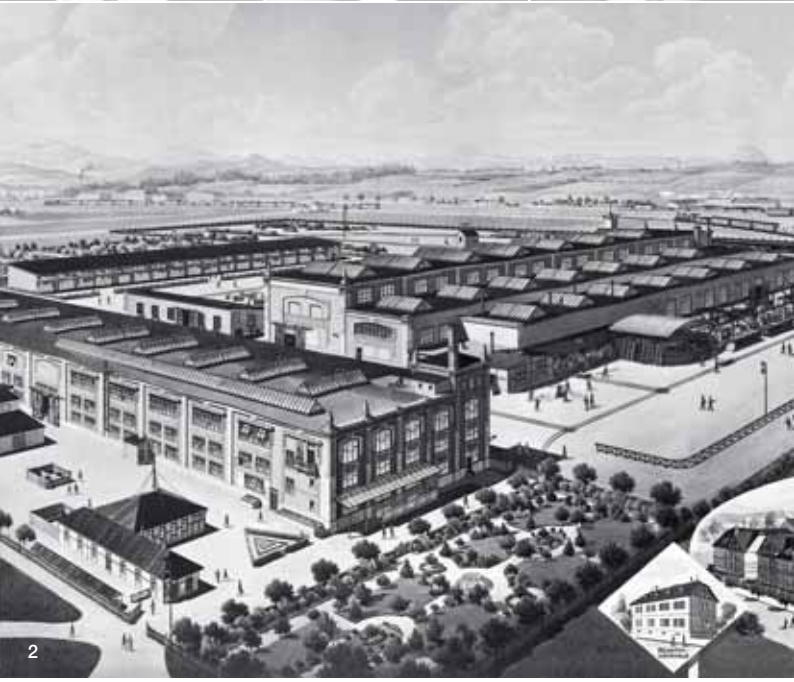
Between 1903 and 1912, Voith delivers 12 Francis twin turbines for the Ontario Power Company power station at Niagara Falls.


J.M.Voith
Maschinenfabrik
Heidenheim
Württemberg

How Inventions Become Basic Technologies … 1913–1945

The years between 1913 and 1945 are a period of enormous technical progress – as well as of social, political, and economic turmoil and crises. Telegraph networks bring the world's countries closer together, a first step towards globalization. Cars, trams, railways and ships make people more and more mobile, and Voith is a driving force of this development – literally. Yet two World Wars, inflation, and global economic depression present huge challenges for Voith as a company.

In 1922, Voith starts with the production of Kaplan turbines.



1 Friedrich Voith's sons, Walther, Hermann, and Hanns.

2 In 1903, Voith opens its first overseas subsidiary in St. Pölten (Austria).

Joint Efforts Pave the Way into the Future

After the death of their father in 1913, the sons Walther, Hermann, and Hanns assume the management of the company. The brothers share the responsibilities: Walther looks after the expansion of the plant in St. Pölten, Hermann deals with the commercial side of the Heidenheim head office, while Hanns manages the technical department. The First World War is hard for the company: overseas contracts cease, 200 Voith employees lose their lives. Inflation makes survival difficult. Voith pays its workers with its own emergency money, which is briefly used as legal tender in Heidenheim.

The third generation

Walther Voith (1874–1947)

- Obtains a doctorate in engineering at Stuttgart Institute of Technology
- Honorary engineer (Ing. eh) of Darmstadt Institute of Technology
- Makes a vital contribution to the expansion and growth of the plant in St. Pölten/Austria

Hermann Voith (1878–1942)

- Doctor of law, commercial director of the Heidenheim head office
- Expands overseas business between the two World Wars

Hanns Voith (1885–1971)

- Engineering studies in Dresden
- After his brothers' death, last remaining male member of the family
- Rebuilds Voith after the Second World War (supported by Hugo Rupf) and converts it into a GmbH (private limited company)
- Guided by anthroposophy and social commitment throughout his life

1918 sees the establishment of the Weimar Republic, which initially ensures more stable conditions. Thanks to prudently distributing their responsibilities, the three brothers manage to move further ahead with the expansion of the Voith plants.

Flow of Ideas

The year 1922 marks another milestone in electricity generation from hydropower: After years of preparatory work, the Kaplan turbine, invented by Professor Viktor Kaplan, is ready for series production – the first model is delivered. Kaplan turbines are mainly used in river power stations, an area where they soon become standard technology. Their decisive advantage: Due to adjustable guide vanes, they are highly efficient, even with smaller heads and lower water volumes.

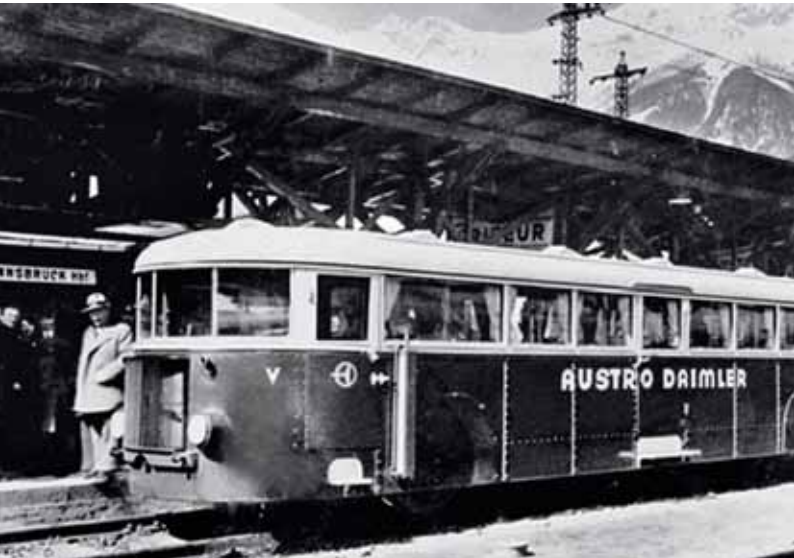
A Logical Step:
New Business Segment: Gear Wheel Construction

Voith draws valuable lessons from the developments during the crisis years. Business in the paper and hydropower in-

In 1932, Voith develops its first transmission for a rail vehicle – an 80 hp railbus in Vienna.

dustry, which is characterized by large orders, has proven to be highly volatile. In 1922, Voith decides to introduce a new business field based on more stable market rules: the construction of gear wheels. Once again, this segment is a logical and organic derivation of the existing core business.

Voith can draw upon its wealth of experience in building gear wheel-driven paper machines and water turbines. The company's know-how in fluid technology, gained in years of turbine construction, also comes in useful. With a series of pioneering inventions, Voith soon supplies the basic technologies for road and rail transport in an increasingly mobile society. In 1932, for example, Voith develops an innovative turbo transmission for the new diesel- or gas-driven railcars that are now continually replacing their old steam engines of the rail operators. The previously installed manual gearboxes would have been only partly suitable for rail applications. The new turbo transmission finds its first outing in 1933 in Austrian railbuses – and its success results in further orders at home and abroad.



1 Hermann Föttinger

2 Ernst Schneider

3 Voith Schneider Propeller

International Mobility Thanks to the Föttinger Principle

The breakthrough comes with an invention by Professor Hermann Föttinger: hydrodynamic power transmission, also referred to as the Föttinger Principle – a technology that is still used all over the world in a wide range of vehicles. With the help of flowing liquids, torque is transmitted effectively and nearly without wear, while speeds are controlled.

In 1929, Voith develops the first hydrodynamic coupling based on the Föttinger Principle, which is used in the pumped storage power plant in Herdecke (Germany). This is soon followed by orders for drives for rail and road vehicles, whose numbers increase rapidly during these years of strong economic growth. Voith also makes a name for itself with hydrodynamic gearboxes and couplings for industrial plants.

Hermann Föttinger (1877–1943)

- Inventor of the Föttinger transmission – a combination of a pump and a turbine named in his honor
- Also developed fluid couplings (Föttinger Couplings)

2

3

Things Are Speeding up – also on the Waters: Voith Schneider Propeller

Thanks to a Voith development, new opportunities also open up for marine traffic. The creative Voith engineers turn a propeller drive invented by the Viennese engineer Ernst Schneider into an ingenious ship propulsion system: the Voith Schneider Propeller. As a marine drive that also functions as a steering device it allows previously unreached degrees of maneuverability, as the sailing direction can be steplessly changed. The Voith Schneider Propeller is used in tugboats, floating cranes, car ferries, passenger ships, and in the Voith Water Tractor. In 1927, the Voith Schneider Propeller is registered as a patent. In 1928, the test boat Torqueo goes on a demonstration trip in Rotterdam harbor (Netherlands), and in 1931, the first three passenger ships with Voith Schneider Propellers enter service on Lake Constance.

Ernst Schneider (1894–1975)

Inventor of the Voith Schneider Propeller, which acts as drive and steering device of a ship and allows maximum maneuverability on the waters

Final Collapse, but Not the End

Nowadays often referred to as the "Golden Twenties," this era filled with hope for continuous progress, prosperity, and peace comes to a sudden halt on 25 October 1929. The events of "Black Friday" at the New York Stock Exchange ignite in a worldwide economic crisis. Unemployment figures rise drastically in all industrial countries, and ideological disputes become more and more confrontational. The political landscape in Germany undergoes an increasing shift towards radicalism. Foreign capital is withdrawn; the Chancellor pro-

50th Anniversary

In 1917, in the middle of the First World War, Voith celebrates its 50th anniversary:

- 6 000 turbines with a total of more than 2 million hp
- Over 100 pocket grinders
- 207 complete paper machines have been delivered to customers so far
- 1881 Voith delivers its first complete paper machine
- 1899 Voith exports its first paper machine to Russia
- 1903–12 Voith produces turbines for the power station at Niagara Falls
- 1906 Voith receives an order for the delivery of turbines to the first hydropower station in China

Voith employees assemble a spiral housing for the Shannon power plant in Ireland, 1923.

claims a state of emergency. In 1933, the National Socialist Party seizes power; Germany is internationally isolated. In 1939, the Second World War breaks out, depriving Voith of its business foundation. The overall production output declines sharply, and the paper construction business comes nearly to a standstill. The end of the war finally means total collapse – 600 of the 4 000 Voith employees have been killed in action or are presumed missing and the company is practically left without any customers. But Voith will take up this challenge, too – and overcome it.

How Economic Miracles Become Reality All Over the World …
1945–1982

Establishment of the Federal Republic of Germany, reconstruction, economic miracle: After 1945, Germany quickly recovers – and so does Voith.

Between 1945 and 1982, the foundations of today's globalized world are created. Individual mobility increases. Be it in cars or on railways, ships, or planes, it becomes normal to overcome huge distances. The international flow of goods gathers momentum. The demand for paper and energy reaches new dimensions. In the 1970s, a new ecological movement emerges out of concern for protecting nature, especially in Western industrial countries. This rise in ecological awareness increases the interest in renewable energies. With its technologies, Voith supplies the foundations for environmentally friendly growth.

In the 1970s, Voith starts with the production of high-performance universal joint shafts.

Let's Get to Work!

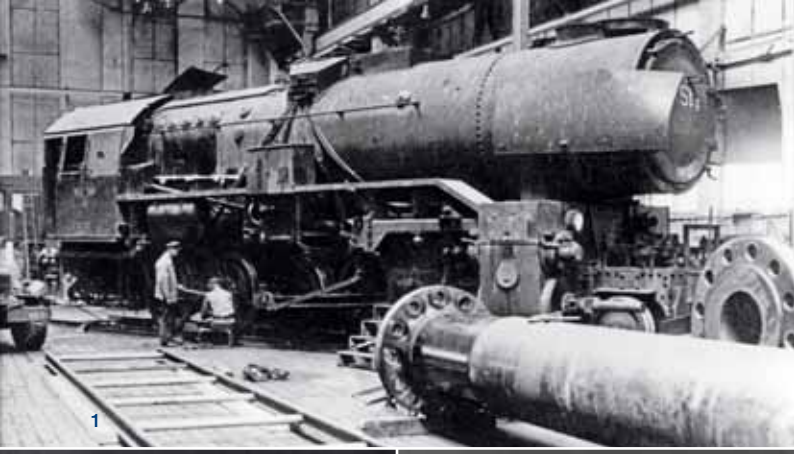
After the death of Hermann Voith in 1942 and Walther Voith in 1947, Hanns Voith is the sole male member of the family. In order to master the heavy burden of postwar reconstruction, he employs the first "external" manager to work alongside him at the top of the company: the graduate economist Hugo Rupf, who joined the company in 1932, when he was 24 years old.

The close confidants jointly set about to rebuild the company. The humanitarian entrepreneur Hanns Voith and the exceptionally gifted businessman Hugo Rupf ideally complement each other with their abilities. But the situation is still serious. The country is divided. Without raw materials, without customers, and with only a few, largely undernourished employees, the company initially has to limit itself to small repair jobs of bridges, to mending American military trucks, refurbishing locomotives, and even the production of saucepans.

New Old Power in the World Market

Hanns Voith and Hugo Rupf succeed in restoring the company Maschinenfabrik J.M. Voith to its former strength. Previous and once very close overseas connections can be quickly revived and expanded. Just one year after the war, the first export orders arrive. The company focuses again on its core business – and can fulfill orders successfully despite the continuing shortage of coal, raw materials, and manpower.

The postwar economy is rallying again, generating steep growth for Voith on an international scale. After only a few years, Voith once again employs 4 000 people. Subsidiary plants are built in Crailsheim (1956) and in Garching near Munich (1963).



1 After World War II, Voith repairs locomotives and railway bridges.

2 Hanns Voith

3 Hugo Rupf

Hugo Rupf (1908–2000)

- Banking apprenticeship, business administration, law, and economics studies in Frankfurt/Main, economics degree
- Joins Voith as a 24-year-old graduate economist in 1932 and is quickly promoted to the Board because of his outstanding commercial skills
- Highly instrumental in expanding Maschinenfabrik J. M. Voith into a globally active group

Showing prudent foresight, Voith acquires a number of secure and lucrative financial holdings during these years of prosperity – the first step towards future expansion through shareholdings and takeovers.

The Right Ideas at the Right Time

In the 1950s, employment levels in Germany show a marked recovery. Millions of people have to commute to their workplace every day; public transport is rapidly expanding. In 1950, Voith begins with the development of automatic differential converter transmissions for buses; these transmissions soon become a standard feature in public transport. In 1968, Voith develops the first retarder for coaches and trucks, a wear-free hydrodynamic continuous brake – another innovation that will turn into a basic technology.

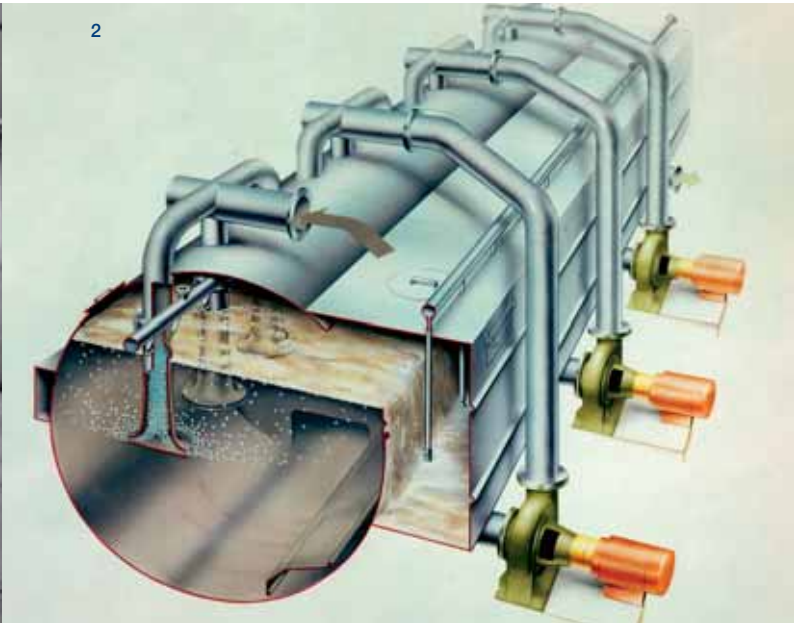
1 Garching, view of the workshop.

2 Drawing of a flotation cell.

Pioneers of the Ecology Movement

The worldwide economic growth also revives the “hunger for paper” – and Voith satisfies it. In 1966, Voith builds the then largest newsprint machine in the world with a wire width of 9 meters for Holmens Bruk paper mill in Sweden. But Voith thinks ahead: At a time when the protection of the environment and the conservation of resources are not yet on the social agenda, Voith invents the flotation deinking method in 1960. This process makes it possible to remove ink from printed paper – and Voith becomes the pioneer for the resource-saving process of paper recycling.

2



Energy for Growth

The worldwide growing economy needs more and more energy. All over the globe, countries are on their way to becoming modern industrial societies. Many of them rely on hydropower as a renewable energy source – and consequently the hydropower business also develops positively. In 1978, Voith receives an order for 12 of the 18 turbines for the hydropower plant on the border between Paraguay and Brazil. It enters service in 1984 as the world's most powerful hydropower station.

New Era, New Business Structures

As a farsighted entrepreneur, Hanns Voith never ceases to think about the continued existence of Voith as a company. He anticipates that the next generation – the descendants of his brother Hermann, and his own six daughters – are less

The first runner for Itaipu arrives at the building site. After its completion in 1988, Itaipu becomes the world's most powerful hydropower station.

likely to be actively involved in managing the company. In 1950, he therefore converts J.M. Voith into a GmbH – a private limited company.

After the death of Hanns Voith in 1971, Hugo Rupf is the one to shape the company, initially as Chairman of the Voith Management Board and, from 1972, as Chairman of the Supervisory Board.

In the 1970s, Hugo Rupf establishes the "Voith Charter," which still serves as a blueprint for many other companies. Its most important instrument is the supervisory body of the company, the so-called Shareholders' Committee, consisting of independent prominent entrepreneurs, as well as representatives of the shareholders. In 1978, Hugo Rupf is appointed as Chairman of the Shareholders' Committee and in 1983 as Honorary President of Voith.

1

The World Is the Market

Ever since the orders for Niagara Falls and the Chinese hydropower station Shi Long Ba at the beginning of the 20th century, Voith has applied the motto: “The World is our Market.” Hugo Rupf and Hanns Voith systematically expand the worldwide presence of Voith. In 1960, the company acquires a stake in the Indian Utkal Machinery Ltd., and in 1964 in Talleres de Tolosa in Spain. The Marketing Companies Voith Engineering Ltd. in the United Kingdom and Voith France S. A. are established.

100th Anniversary

In 1967, Voith celebrates its 100th anniversary.
The track record:

- 17 000 water turbines
- 850 paper machines
- 22 000 gear drives
- 1 550 Voith Schneider Propellers
- 16 500 turbo transmissions
- 25 000 DIWA transmissions
- 10 000 cooling systems and fans and 400 000 turbo couplings

1 1964 Voith establishes the Voith plant in São Paulo.

2 1982 Voith completes the then largest machine for fine papers for Eastover in South Carolina.

In order to be close to the customer, production sites are also set up abroad. This is the only way to win markets for the key products of the company in the long term and also secure deliveries from Heidenheim. In 1964, Voith establishes the Brazilian subsidiary Voith S.A. in São Paulo. In the 1970s, Voith focuses especially on North America. As part of a market offensive, the Group gains a foothold there with its own production facilities and through acquisitions.

After Hugo Rupf changes from the Management Board to the Supervisory Board of Voith in 1973, his successors at the helm consistently continue the internationalization of the Voith Group of Companies.

- 1950 First Voith Water Tractor
- 1957 Voith Turbo Transmissions for Deutsche Bundesbahn
- 1962 Turbines for the largest pumped storage power station in Vianden
- 1966 World's largest newsprint machine with a wire width of 9 m for Holmens Bruks in Hallstavik, Sweden

How Innovative Technologies Move Economy and Society Forward …
1982

Since the 1980s, globalization has been accelerating rapidly. The Internet removes any communication or trade barriers. And real borders between countries are also disappearing: the Berlin Wall falls, the Eastern Bloc dissolves, the eurozone is created. The BRIC states and other emerging markets see high growth rates. And society is becoming aware of another key issue: sustainability. It is the new driver for economic growth and the yardstick for technological innovations.

Urbanization is forging ahead faster and faster: in the Far East, huge cities are rising from the ground at breathtaking speed, agglomerations turn into megacities, where ten or 20 million people live and work. This calls for totally new concepts of mobility – Voith supplies not only reliable technologies and ideas but also digital solutions. With the explosive growth of the world population, the need for energy also rises.

1 In 1996, PM 53 from Voith enters service in the Swedish paper mill Braviken – at the time the fastest paper machine in the world with a speed of 1700 m/min.

2 Vorecon, a variable-speed planetary gear for industrial plants, was developed by Voith engineers in 1985.

The climate change caused by CO_2 emissions is recognized as a central global threat. Therefore, many economics increasingly rely on renewable energies. In 2011, the German government introduces its “Energy Transition” policy. Solutions from Voith allow the generation of electricity from hydropower in unimagined dimensions. Pumped storage power plants, a technology invented by Friedrich Voith more than 100 years ago, form the backbone for power generation from renewable sources in the 21st century.

Land of Unlimited Possibilities

During the last two decades of the 20th century, the internationalization of Voith is gathering momentum – initially mainly in North America. In 1983, Voith gains entry in the paper machine clothing market by taking over Appleton Mills in Appleton, Wisconsin (USA) and supplements its portfolio by paper machine consumables such as felts and wires. The hydropower business is also anchored in the North American market. In 1986, Voith acquires the hydro business of the US market leader Allis Chalmers in York, Pennsylvania (USA). The sales and service activities for drive technology in North America are also relocated to York.

The Core Businesses are Newly Positioned

Yet the company once again has to get through difficult times. In the early nineties, differing views about the development of Voith result in a splitting of assets of the company and the withdrawal of the Hermann Voith family line. They receive a large proportion of the financial investments and the machine tool part of the business. The heirs of Hanns Voith keep the core businesses paper machines, paper machine clothing, power transmission, and turbine and marine technology and continue the company in the spirit of their father. From 1986 to 2000, the company is led by Dr. Michael Rogowski, who is followed by Dr. Hermut Kormann (2000 – 2008) and, since 2008, by Dr. Hubert Lienhard.

On Continued Course for Expansion

Through strategic joint ventures and company acquisitions, Voith succeeds in strengthening the market positions of its

Mechanics from Voith Industrial Services carrying out maintenance work at a refinery.

business fields. In 1994, Voith and the Swiss Sulzer Group form a joint venture in the paper technology sector. In 2000, Voith secures the majority stake in this enterprise. In 1999, Voith takes over the business fields paper machine clothing, roll covers, and service from the British company Scapa. This procurement is still the largest acquisition in the company's history. With the establishment of a joint venture between Voith and Siemens, the leading manufacturer of turbine technology and the leading supplier of generators form an alliance.

In the Service of Industry

Voith closely monitors the growing demand of industry for a wide range of services: Companies are increasingly focusing on their core business and outsource other tasks to specialists. In 2000, Voith acquires a majority stake in DIW Deutsche Industriewartung AG, thus creating the foundations for the new Group Division Voith Industrial Services.

Focus on Digitalization

In 2016, the Voith Group speeds up its efforts to open up new growth opportunities in the field of Industry 4.0 and adjusts its portfolio accordingly. In this context, Voith also takes entrepreneurial steps. On the one hand, the company focuses on its technological competencies and sells the entire Group Division Industrial Services. On the other hand, Voith establishes the new Group Division Voith Digital Solutions, where it pools its complete IT and automation know-how. The new Division focuses on the development of new digital business models both for already existing and for totally new industries that had previously not been supplied. The aim is to consistently develop Voith into a company that will actively participate in shaping the digital change in its industries and markets.

Spirit of Departure in the East

The focal point of geographical expansion is shifting to the East, the Far East. Countries such as India and China are

Guangzhou II (China): one of the largest pumped storage power plants in the world, fitted with technology from Voith.

rapidly developing into modern industrial nations – for building up their infrastructures, they need paper, energy, mobility, and services in previously unknown dimensions. Voith recognizes its opportunities in these markets and commits itself in the new growth regions.

In 1994, Voith sets up its first representation of Voith Paper in China in Beijing. In the same year, the foundation stone is laid for the production of turbines and generators in China: Together with Siemens and the Chinese partner SEMMW Voith launches SHEC – Shanghai High-Technology Equipment Company Ltd. Only two years later, a production site for paper machine clothing is opened in Kunshan near Shanghai. The Chinese location for paper technology in Kunshan is continuously expanded. In 2010, the center for all paper technology activities of the company in the entire Chinese market is officially launched here: in Voith Paper City. Voith Turbo, already represented in Hong Kong since 1985, also sets up a production site in Shanghai in 2002.

Looking into the Future …

Starting out in 1867 as an up-and-coming locksmith's business on the Swabian Jura, Voith has written engineering history ever since – and thus changed the world. Our initiatives and projects everywhere in the world are inextricably linked with our aspiration for responsible growth. With this in mind, we see ourselves as a company that delivers more than "just" products or solutions. We make a valuable contribution to basic services required by people and industry, to proper standards of living, to sustainable economic growth, and thus also social development.

The history of Voith highlights what makes this company so special – and what will also be the basis for its future success: the ability to anticipate economic and social developments at an early stage and to adapt the company to these developments; the creativity to turn bold ideas into marketable products; the courage to venture into new business fields and new markets and to link the company's highly specialized technical know-how with completely new technologies; as well as the determination to support all customers with the completion of their projects.

The world of the first quarter of the 21st century is totally different from the one of the late 19th century. But there is one thing that is still as relevant as it was then: It is full of challenges – and full of opportunities. A rapidly growing world population, emerging economies, advancing urbanization, increasing mobility, the desire and the growing necessity to use renewable energies. Our ever-changing world needs new concepts and solutions in order to make growth sustainable – and Voith supplies the technical foundations for this need.

Our company is at the forefront when it comes to developing technologies that promote growth and prosperity and make our world a better place to live in – since 1867 and also in the future …

Milestones

1825 Johann Matthäus Voith takes charge of his father's workshop.

1848 Johann Matthäus Voith starts with the development of machines for paper production.

1859 Voith develops the first wood grinders and thus creates the basis for paper production on an industrial scale.

1867 Johann Matthäus Voith hands over the business to his son Friedrich. January 1, 1867, is the official date of the foundation of J. M. Voith.

1869 Voith is granted the first patent in the company's history – for a wood grinder.

1870 Voith enters the turbine production business with the construction of a 100 hp Henschel-Jonval turbine.

1879 Voith develops the first turbine control unit.

1881 Construction of the first complete paper machine for Raithelhuber, Bezner & Cie. in Gemmrigheim (Germany).

At the beginning of the 20th century Voith delivers the turbines for the Ontario Power Company on the Niagara Falls

1903 Foundation of the first foreign subsidiary in St. Pölten, Austria. Voith receives an order for the delivery of the turbines for Ontario Power Company at Niagara Falls (Canada); Voith supplies a total of 12 Francis twin turbines, each rated at 12 000 hp. At the time, they are the largest turbines in the world.

1906 Voith receives its first order from China and delivers turbines for Shi Long Ba, the country's first hydropower station. It enters service in 1910.

1908 Inauguration of the turbine test laboratory and the first pumped storage power plant in Germany at the Brunnenmühle in Heidenheim.

1910 Voith opens its first training workshop in Heidenheim.

1913 Friedrich Voith dies at the age of 73. His sons Walther, Hermann, and Hanns share the management of the company between them.

1927 The Voith Schneider Propeller is registered as a patent.

1932 Voith develops its first turbo transmission for a railbus of Austro-Daimler-Puch in Vienna.

1950 Patent registration for the first Voith Water Tractor.

1952 Voith starts with the production of DIWA bus transmissions.

1960 Together with the paper mills Haindl and Palm, Voith develops a new process for recovering pulp from waste paper: the flotation deinking method.

1964 Foundation of the subsidiary Voith S.A. in São Paulo (Brazil).

1968 Voith develops the retarder for commercial vehicles.

1977 Delivery of the first high-performance universal joint shaft for rolling mills.

1978 Voith receives an order for the delivery of 12 Francis turbines for Itaipu on the border between Paraguay and Brazil, at the time the world's most powerful hydropower plant.

1983 With the takeover of Appleton Mills in Appleton, USA Voith expands its portfolio to include paper machine clothing.

1985 Voith develops the Vorecon, a variable-speed planetary gear for industrial plants.

1986 Voith acquires the hydropower business from Allis Chalmers in York (USA).

1994 Voith and the Swiss Sulzer Group form a joint venture trading as Voith Sulzer Papiertechnik.

1994 Voith, Siemens, and Chinese partner SEMMW form the joint venture SHEC (Shanghai High-Technology Equipment Company Ltd.), now Voith Hydro Shanghai Ltd.

1997 Voith receives an order for the delivery of six machines rated at 700 megawatt each for the Three Gorges hydropower plant in China.

1998 Voith acquires Scharfenbergkupplung in Salzgitter.

1999 Voith acquires the business segments paper machine clothing and roll covers for the paper industry from Scapa (United Kingdom).

2000 Voith and Siemens form a joint venture – Voith Siemens Hydro Power Generation. Since 2009, the Group Division is called Voith Hydro.

2000 Voith acquires the majority in DIW Deutsche Industriewartung AG and founds its fourth Group Division – Voith Industrial Services.

2004 Voith acquires Hartmann + Lämmle, a leading manufacturer of hydraulic system solutions in Rutesheim.

2005 Voith takes over the US-American Premier Group, a specialist for manufacturing support services in the automotive industry.

2006 Voith acquires the majority in Hörmann Industrietechnik in Kirchseeon near Munich. Hörmann Industrietechnik is a specialist for production services in the automotive industry.

2007 Voith acquires BHS Getriebe GmbH, a leading manufacturer of high-performance gears and couplings in Sonthofen.

2008 Voith acquires Kössler in St. Georgen am Steinfelde (Austria). Kössler is a complete supplier of small hydro systems.

2008 Voith acquires Ermo, a German company specializing in services for power stations and refineries in the petrochemical industry.

2008 Voith celebrates the 100th anniversary of the Brunnenmühle research facility, which has just been modernized through an investment of more than EUR 20 million.

2010 Voith celebrates the opening of its new production and service center for the paper industry in Asia – Voith Paper City – in Kunshan.

2014 Opening of the Voith Training Centers in Kunshan and Heidenheim. The training center concept at Voith promotes communal learning and a team spirit among the young employees. In Heidenheim, the training workshop on the ground floor is designed as a large, open space. Creating a special learning atmosphere is a building block of the Voith-developed vocational training concept. The vocational and professional training center in Kunshan (some 80 km northwest of Shanghai) is the company's largest educational establishment outside Germany.

2015 Voith and Huatai Paper enter a strategic partnership to jointly utilize the opportunities in the Chinese paper market.

2016 Voith establishes a new Group Division: Voith Digital Solutions.

2016 Voith sells the Division Voith Industrial Services. As part of the Group-wide success program Voith 150+ Voith had announced in 2015 that the company would in future focus on its technology and engineering competencies for the digital age.

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