EISENMANN

DAVINCI

The Corporate Magazine N°06 | December 2014

The US success story

Innovation drives growth

ThinkNow

A bright future in the burgeoning US market

ThinkGreen

More energy, less waste

ThinkTomorrow

Shed those pounds: lightweight construction is taking over the US auto industry

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Dear readers,

The United States, Germany's **number-two export market** outside Europe, is of huge importance to Eisenmann. We have maintained a presence there since the late 1970s and our US business is enjoying highly satisfactory growth (page 18). The US economy is improving and its employment market is expanding. As a German technology company, we wish to contribute to the USA's economic upswing by providing **local support to our customers**.

Low energy prices are playing a major role in the US market's boom, prompting many manufacturers to move **production** back to the States. In an interview on page 6, my fellow board member Dr. Link talks about the **conditions we operate under** as a provider of production systems and related services.

Despite low energy prices, and with the encouragement of new federal policies and regulations, public attitudes are starting to change: Enterprises are adopting **new approaches** to **energy generation** and converting biowaste to natural gas. For instance, a forward-looking waste management company in California now uses an Eisenmann plant to produce the natural gas needed to run its entire vehicle fleet. The executive director of the recently founded American Biogas Council sees **enormous potential** for this market (page 9).

In addition to environmental engineering, one of the **hottest trends** in the US market today is **lightweight construction**, particularly in the automotive sector. OEMs are working hard to make intelligent use of lightweight materials, so that tomorrow's models will meet new mandatory fuel consumption standards (page 14).

We hope you find the latest DaVinci both educational and entertaining.

Dr. Matthias von Krauland
Chief Executive Officer

+++ Conveyor systems +++

Electrified monorail system for North America's largest refrigerated warehouse

Preferred Freezer Services' cold storage facility in Richland, Washington, will be the largest in North America upon its completion in the summer of 2015. This fully-automated warehouse is designed to handle 7,000 pallets daily, each weighing approximately one and a half metric tons. As frozen goods by nature are perishable, a reliable conveyor system is of the utmost importance. For this reason, Preferred Freezer Services, a full-service temperature-controlled warehouse provider based in New Jersey, is investing a 7-figure amount in the electrified monorail system from Eisenmann.

35 Eisenmann trolleys will be operating around the clock, seven days a week, on a conveyor system approximately 750 meters in length. While traditional refrigerated warehouses rely on human-operated cranes, "this will be our sixth fully-automated cold storage facility, and we are already planning further projects," states John J. Galiher, CEO, Preferred Freezer Services. "As refrigerated warehouses are getting larger, the conveyor systems are becoming more complex. It is very important to us that the facility is flexible, fast, and totally reliable. Against this background, we were looking for a proven solution. According to our research, Eisenmann systems are the best worldwide in terms of performance, reliability and quality."

The electrified monorail system will connect the receiving department with the warehouse, picking department, truck loading bay, and railroad spur. Preferred Freezer Services is investing over 100 million US dollars in the project, which is being overseen by Dematic, a material handling and logistics automation company. Preferred Freezer Services has four additional cold storage facilities on their agenda for 2015, all of which will be fully-automated.

Preferred Freezer Services' management team on a visit to Eisenmann in Germany.

+++ Societas Europaea +++

Eisenmann AG is now SE

Conversion completed

Eisenmann has completed conversion to a European Company (Societas Europaea, SE) on September 17th, 2014.

"Converting to an SE underlines our global presence and highlights our evolution from a mid-sized company to an international technology player," says Dr. Matthias von Krauland, CEO and Chairman of the Board of Eisenmann SE. The other members of the former Executive Board remain members of the new Board as well as the Management Board under the new legal form.

"This new legal form won't change anything at all for our business partners and customers; Eisenmann SE's headquarters will remain based in Böblingen," adds Dr. Matthias von Krauland. The conversion will also not affect the group's subsidiaries.

Trade shows

January 2015

27 - 29 Biogas Convention
Bremen, Germany

February 2015

10 - 12 LogiMAT
Stuttgart, Germany

March 2015

03 - 06 Interlakokraska
Moscow, Russia

10 - 12 JEC Europe
Paris, France

April 2015

28 - 30 Waste and Bioenergy Forum
Kassel, Germany

May 2015

06 - 08 IE expo/IFAT China
Shanghai, China

26 - 28 WasteTech
Moscow, Russia

June 2015

15 - 19 ACHEMA
Frankfurt, Germany

16 - 20 THERMPROCESS
Düsseldorf, Germany

For current events, please go to
www.eisenmann.com

We value your opinion!

DaVinci is celebrating its second birthday – high time to ask for your feedback.

Take part in our **online survey** and you could **win** a weekend for two in Florence (including flights, accommodation, and two tickets to the Leonardo da Vinci Museum).

To access the survey scan the **QR code** below or log into
www.surveymonkey.com/s/eisenmann-da-vinci

Please complete the survey by February 15, 2015.

Everyone who takes part in the DaVinci 06 survey and answers every question is automatically entered into our prize draw. It is not possible to take part unless you enter your personal details. Eisenmann Group employees and persons under 18 years are not eligible.
The draw period is December 1, 2014 to February 15, 2015.

A bright future in the burgeoning US market

Dr. Kersten Christoph Link
COO/CTO, Eisenmann SE

The US economy has bounced back strongly from the financial crisis. Not only are North American companies reshoring their manufacturing operations, but European businesses are also heavily investing in the USA. DaVinci spoke to Dr. Kersten Christoph Link, Eisenmann's COO/CTO, responsible for business operations in the US.

Dr. Link, what kind of business opportunities does Eisenmann have in the US?

Many US companies have returned to growth after the difficulties they faced in 2009. They have really done their homework by increasing productivity while reducing production costs. And aided by lower energy prices, they now boast competitive advantages that they are leveraging to full effect. As a supplier of capital goods, we are benefitting from an economy where companies are again making significant investments. As a result, the Land of Opportunity has become one of our most important markets, where we are involved in a number of exciting projects.

What do you offer to companies looking to invest in the US?

We manufacture high-quality, tailor-made systems. These range from general finishing and environmental technologies to material flow automation and high-temperature processing. Moreover, Eisenmann deploys technologies that are both innovative and proven. US companies also value our made-to-measure services. When they purchase capital goods, they are primarily looking for high quality and outstanding uptime in conjunction with low operating expenditure. The US market allows us to make excellent use of our strengths, particularly in comparison to low-cost countries more focused on low capital expenditure. We also provide assistance and advice to many German and European clients investing in the US and elsewhere.

Are you seeing higher levels of demand from specific industries?

All our business units have been handling inquiries and orders from a range of industries and regions across the US. In particular, I would mention surface finishing for vehicle and auto component manufacturers, and our work for chemicals manufacturers, who have been deploying our environmental engineering systems for a number of years. There are also new business opportunities in renewables, including biogas.

Could you describe a recent project?

In California, we are currently constructing the US's largest biogas plant for CR&R, a recycling and waste collection company. The plant, currently in its first phase of construction, already processes 80,000 metric tons of mixed organic material annually. CR&R collects this material from over 2.5 million consumers and 5,000 businesses in Los Angeles and its surrounding areas. We then refine the biogas to create biomethane, which is used to power CR&R's fleet of around 700 refuse collection trucks. The goal is for the plant to process roughly 300,000 metric tons of refuse annually upon its completion. In contrast to Germany, there is no »

"When they purchase capital goods, US companies look for high quality and value made-to-measure services."

» nationwide legislation in the US that subsidises renewables through levies on electricity. CR&R secured only very small funding from local government for capital expenditure. Against this background, the project's economic viability shows just how efficiently our technology works.

Do you have any other examples?
We are constructing large-scale paint plants in the US for Mercedes and BMW. And we are working for a number of US auto-industry companies. We have been particularly focused on the construction of lightweight car components, which contribute substantially to improving fuel economy. By 2025, US auto makers must have significantly reduced their vehicles' fuel consumption. A fleet-wide average of 35 miles per gallon today must be increased to 55 mpg. Our core competencies include technologies for manufacturing smart lightweight materials: high tensile steel, aluminium and carbon fiber. In addition, Eisenmann is working on multiple projects within the energy-intensive chemical industry.

How does Eisenmann support its North American customers?
We established our US subsidiary almost 40 years ago, and have been an active market player ever since. In the early days, our first major contracts were for paint plants for the leading US auto makers. But Eisenmann soon diversified into many other industries. Around 100 employees serve our US customers from our subsidiary in Crystal Lake, Illinois. For larger-scale projects, we also send specialists over from our corporate headquarters in Germany. This collaborative relationship creates very effective teams. Eisenmann has an extensive value chain in the US, and its own engineering resources. We collaborate closely with all our customers, and have established a strong network.

Is there anything unique to the US market that Eisenmann and its employees have to take into account?
Americans and Europeans have similar mindsets. This makes it easy to initiate discussions and do business together. And the US still holds a real fascination for us Europeans. When we are involved in long-term projects in the US, it is easy to find employees from Germany who are happy to live and work out there for an extended period. In terms of technology, local legislation presents an ongoing challenge. Applicable standards differ from those in Europe. And even these can vary from region to region. But over the years, we have become very experienced at managing these challenges.

How do you think things will pan out with TTIP?
The Transatlantic Trade and Investment Partnership has been a source of fierce, sometimes emotional, debate in Germany, but it is not really an issue in the US. Young people in particular support the agreement. They are hoping it will deliver enhanced digital privacy and higher consumer protection. As I see it, these expectations favour our export prospects in the US. And I firmly believe that the US and Europe will move closer together, given the current political situation. This suggests that the TTIP negotiations will be successfully completed.

Thank you for this interview.

More energy, less waste

North American companies are discovering biogas, an attractive source of environmentally friendly power. Eisenmann provides the necessary technical solutions.

Producing biogas in an environmentally friendly way while at the same time generating revenue is an attractive business model – and more and more industries in North America are currently exploring this new avenue. For instance, The Innovation Center for U.S Dairy warmly recommended this approach to the agricultural sector in its 2013 study, "National Market Value of Anaerobic Digester Products". But many other types of businesses could benefit from investing in biogas. This was underscored a year earlier when the U.S Environmental Protection Agency (EPA) published a study on biogas generation and utilization. Eisenmann has operated in North America for almost four decades, and offers the necessary technical solutions to produce biogas through anaerobic digestion. »

» James McMillin, Head of Sales in Eisenmann's Environmental Technology business unit, assesses the situation as follows: "The market has huge potential, but it's still very much in the development stage". McMillin believes that the main difference between North America and Europe – Germany in particular – lies in the underlying economic framework. Whereas renewable energies have been heavily subsidized by the German state, the adoption of green technology in North America is still largely market-driven. "But waste management companies and local government authorities are expecting new legislation and regulations to be introduced sooner or later. And the earlier they establish themselves in this business, the better their market chances will be," adds John McDowell, Sales Engineer at Eisenmann USA.

"The market has huge potential."

There is currently strong interest in biogas technology, especially in coastal regions. This is due to the population distribution and the shape of the country's industrial landscape, according to the Eisenmann specialists. In areas of high population density, electricity costs tend to rise. This makes the production of electric power from organic waste via biogas an appealing business proposition. In addition, there is less space for landfill sites in urban areas. Biogas plants can be located out of town and, as well as supplying electric power and heat, they also provide fertilizer and plant substrates – raw materials that can be returned to the production cycle.

McMillin and McDowell agree that customers in the USA are looking for plants that are extremely versatile. Unlike the first-generation digesters deployed in Germany, which used relatively homogenous plant material as feedstock, the biogas plants for North America will need to handle a wide variety of organic fractions of municipal waste, biowaste and food waste. That's exactly the kind of materials California-based waste disposal company CR&R plans to use. It will help it drive down carbon dioxide emissions, reduce the space needed for landfill sites and improve the efficiency of its garbage collection fleet. The biogas produced will be processed in an upgrading plant to be turned into fuel for its garbage trucks. According to CR&R, only Eisenmann's system is capable of processing the many different organic materials in the 80,000 tons of waste collected each year, and can deliver a high biogas yield, too. That's why the company opted for an Eisenmann biogas plant. When it goes online, it will boast one of the largest anaerobic digesters in the country.

"The opportunities for replacing natural gas with biogas are practically boundless"

The American Biogas Council (ABC) was established in 2010 and Patrick Serfass has been its Executive Director since 2011. Eisenmann has been closely involved in the ABC's foundation and its work. Serfass spoke to DaVinci about what it has achieved to date, and about the development potential of biogas technology in North America.

Mr. Serfass, do you think biogas will reshape the American energy market?

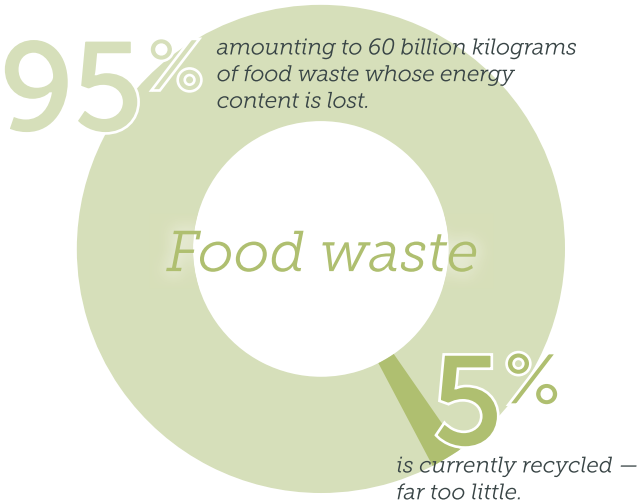
Absolutely. The potential for further growth is huge – mostly due to the very large volumes of organic materials that are not currently recycled. With minimal processing, biogas is a renewable substitute for compressed natural gas (CNG) so the opportunities for its use are practically boundless-fuel vehicles, produce electricity and heat, or inject it into the network of gas pipelines, use it as a chemical compound to create other products, etc. Plus, biogas systems create nutrient-rich products from the digested material. This versatility makes biogas systems very attractive, from an ecological as well as from an economical perspective. »

» *What are the ABC's most important goals?*

Grow the US biogas industry. This means, removing barriers and delays to project development, like interconnection and permitting issues, while also proactively creating an atmosphere and smart policies so biogas companies can build profitable, tax-paying businesses. Behind all of these needs, education is needed, especially on the benefits of biogas systems, like their ability to help achieve zero waste and recycling objectives. And finally, while biogas technology in general is well-established commercially, the industry still has R&D needs and lots of room for innovation. For example, research on the optimization of nutrient separation and capture technologies that are used at the end of a biogas system.

What role can biogas play in reducing food waste?

To recycle food, you have two options: compost and biogas systems. Imagine your dinner scraps get digested in a biogas system, create renewable energy from the biogas and then the solids and liquids left over are applied as organic fertilizer to grow new food.



The US Department of Agriculture counts 133 billion pounds of food lost each year and the Environmental Protection Agency says that only about 5% of food waste is recycled. If we recycled half of it, that inedible food could power over 1 million homes.

The concept of recycling food waste has not caught on and if we can change that, we will create significant business opportunities. The good news is that some states and cities have passed regulations that now require food waste to be recycled, like Massachusetts, Connecticut, New York City and San Francisco. The American Biogas Council has been writing and working to put more of these policies in place to encourage organic materials to be recycled.

American biogas Council

A dynamic, successful Italian

Gabriele Di Furia
Head of Sales, Automotive USA

As the new Head of Sales of Automotive USA, you're embarking on an exciting new chapter in your career. How are you approaching this challenge?
I'm thrilled about the opportunities and challenges of working with our customers in person in the USA. A positive working relationship with our customers is my highest priority, and is key to our company's success. If the customer's satisfied, so am I.

What makes sales so exciting to you?
The variety. Working in sales means interaction with a multitude of different customers and cultures. Of course, I also find the classic sales processes stimulating – from customer service, planning, conceptual development with designers and draftsmen to the pitch, project execution, after-sales and marketing activities. I enjoy my job – there's never a dull moment.

What do you like doing best in your free time?
What little free time I have, I prefer to spend with my friends and family. To clear my mind after a day's work, I usually do sports – running, mountain biking, or the gym. Sometimes I simply go for a walk with my wife.

What drives you?
I'm self-driven – it's in my blood. At an early age, my parents taught me to finish what I begin, and that's become my guiding principle for work and home. I don't do half measures.

What makes up a good start to your day?
A run, a shower, and ideally a Cappucino e Cornetto – after that, I'm ready to face the day.

What personal success are you proudest of?
Everything I've achieved to date, from a below-average high-school student to qualified engineer.

What do you value most?
Honesty and respect for others.

Do you have a philosophy?
Enjoy your life!

Do you have a role model?
The Italian motorcycle racer – and multiple world champion – Valentino Rossi. Nothing can keep him down, and he always has fun with and succeeds at his job.

Do you have a dream?
A cottage among the vineyards of Italy. ■

Shed those pounds: lightweight construction is taking over the US auto industry

The great American gas-guzzler is on its way out: US legislation now sets down stringent fuel economy standards. Lightweight construction will play a major role in cutting consumption.

When the first-generation VW Golf won the hearts of Germany's drivers in 1974, it had a curb weight of 790 kilograms. The lightest Golf 6 model had a curb weight of 1234 kilograms.

These two cars are worlds apart in terms of comfort, features, and performance. Yet in combined driving cycles, the new Golf consumes only six liters of gasoline per 100 kilometers – far less than its forebear.

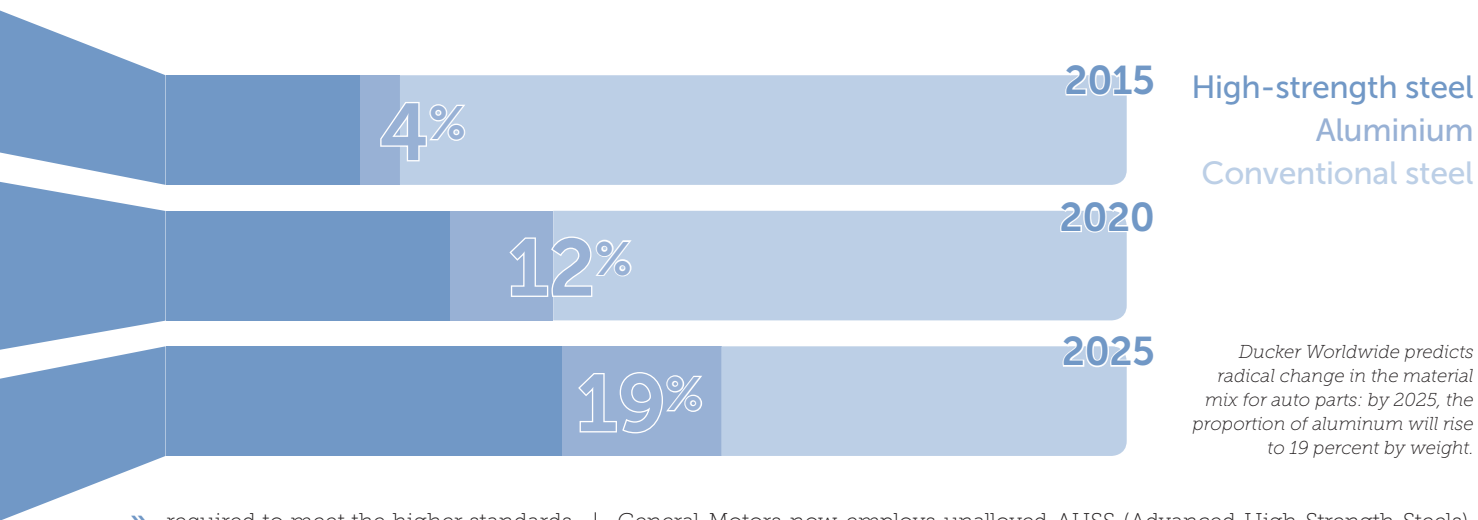
As this example shows, the automotive industry has already exploited to the limits numerous methods of driving down consumption even while improving vehicle functionality. However, the European Union has set a target to further reduce average emissions of its new car fleet – to below 95 grams of carbon dioxide per kilometer by 2020. This corresponds to about four liters of gasoline to 100 kilometers. Carmakers and their suppliers, as well as plant engineering specialists and system suppliers such as Eisenmann, have long been working intensively on lightweight construction technologies and processes that will make even this target attainable. After all, one rule of thumb states that in a mid-range vehicle, every 100 kilograms weight saving cuts consumption by up to half a liter per 100 kilometers.

For a long time, European car manufacturers believed themselves to be the only ones developing these fuel-saving solutions. In 1994, for example, Audi introduced the A8 with an aluminum body, and since then the industry has seen many lightweight construction techniques emerge. Most recently, BMW unveiled the model i3 electric car, the first mass-produced vehicle with a passenger compartment made of carbon-fiber-reinforced plastic (CFRP). However, lightweight construction has been on the rise in the USA, too – ever since the Corporate Average Fuel Economy (CAFE) standards introduced significantly stricter curbs on consumption. By 2025, manufacturers that want to sell vehicles in North America are required to reduce the fuel consumption of their new car fleets in two stages to 4.31 liters of gas per 100 kilometers.

Anyone familiar with the US auto market will no doubt regard this as an attainable goal – particularly since large and roomy vehicles are still very popular there. Last year, the average new car in the United States weighed in at around 1624 kilograms, taking first place in an international comparison. A simple step towards the four-liter goal would be to ban pick-ups and SUVs. However, "car manufacturers are not permitted to reduce the model's size in order to comply with the CAFE standards. Passenger cars are »

Adam Halsband
Business Development Manager

"New lightweight construction materials pose significant assembly challenges for carmakers. The automotive industry requires special adhesives and sealants to join the different materials. The Eisenmann subsidiary intec Bielenberg develops innovative adhesive and sealant dispensing solutions and is recognized as a leader by carmakers and their suppliers."



Ducker Worldwide predicts radical change in the material mix for auto parts: by 2025, the proportion of aluminum will rise to 19 percent by weight.

» required to meet the higher standards applicable to their vehicle class – so the required consumption rate is only achievable by improving efficiency," emphasizes Adam Halsband, Business Development Manager and automotive expert at Eisenmann USA.

Lightweight construction plays a critical role in making the necessary efficiency gains. Automakers are working hard to meet US government agencies' CAFE consumption standards with an intelligent mix of lightweight materials chosen with due regard for recyclability. The technology leaders among them are not only in pole position – they are on track and surging ahead.

General Motors now employs unalloyed AHSS (Advanced High Strength Steels), PHS (Press Hardened Steel) and HPDC (High Pressure Die Cast) aluminum. Many of these high-tech materials are used alongside CFRP in the mid-range Cadillac ATS, which is based on the carmaker's lightweight Alpha platform. GM is hoping that lower-weight models such as this will generate high sales in the European market as well.

Ford, on the other hand, is making headlines with its F-150 – the USA's best-selling vehicle. Thanks to the high proportion of aluminum in the body, this new pick-up weighs around 340 kilograms less than its predecessor. Another prime example of lightweight construction is Tesla, the shooting star among luxury electric car brands. Their first mass-produced car, the Roadster, has an aluminum frame weighing a mere 65 kilograms. The body itself is made of CFRP. Although the battery pack alone weighs just over 400 kilograms, the Roadster's total weight is only about 1240 kilograms.

Many components, such as wheels, cylinder blocks and heads, shock absorbers and drive system components are already being made from lightweight materials. According to market researcher IHS Automotive, the chassis, frame and body

alone account for some 62 percent of the overall weight of an average car in the USA. In 2012, the breakdown of materials used in these three assemblies was as follows: 84 percent conventional steel; 15 percent high-tensile steel and one percent aluminum. But consulting firm Ducker Worldwide predicts that by 2025, the proportion of aluminum will rise to 19 percent against only 40 percent high-tensile steel.

"There's every indication that processed steel and aluminum alloys in lightweight construction will come to play a major role in the US auto industry. And the reports and activities of our American partners only confirm this trend," relates Axel Weiand, a manager in Eisenmann's Process & High Temperature Technology business unit. Aluminum and steel alloys generally have to undergo heat treatment to obtain the high strengths demanded. Eisenmann, one of the world's leading manufacturers of heat treatment plants, boasts deep process skills and the broad experience acquired through building a large number of these systems.

It offers solutions for treating structural components, cylinder heads, engine blocks, gears, wheels, and other parts made from aluminum. "We provide tailored solutions for processes such as solution annealing, quenching and aging that are used to obtain thermally hardened aluminum alloys," explains Weiand. "The heat treatment plants are designed with a very specific goal in mind: to achieve stable, reproducible and efficient processes to ensure ideal material properties."

Eisenmann also builds plants for pre-treatment of strips, such as sheet metal for aluminum car bodies. They take up little space, are easily maintained, and consume few resources. Eisenmann provides outstanding process expertise, technology and production solutions for another promising material employed in high-volume lightweight vehicle manufacturing: carbon fiber. Precise and consistent process control is key to cost-effective carbon fiber production. Eisenmann's own testing facilities also enable their partners to conduct the kind of experiments needed to achieve it, and gradually learn to navigate the uncharted territory that is lightweight construction.

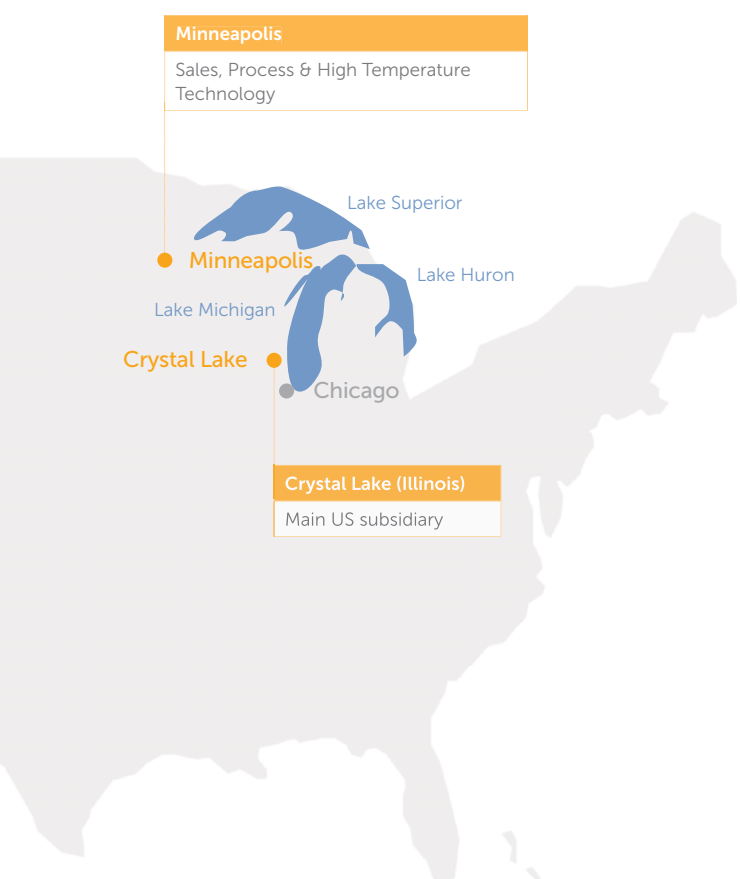
USA

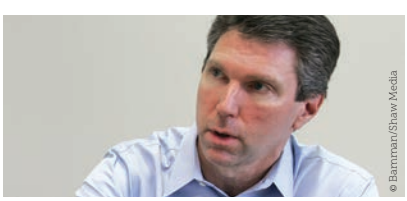
Dynamic markets drive innovation forward.

The USA is a leading industrial nation, possessing the latest technologies and the knowledge and skills of highly qualified experts. The strong market dynamic benefits those who invest in this key region – domestic manufacturers and foreign businesses alike. Eisenmann has been exploiting the opportunities of this adaptable market since 1977, starting with an office on the outskirts of Detroit, near the General Motors and Ford headquarters. Today's US subsidiary is located in Crystal Lake, close to Chicago. About 100 employees there offer US-based customers a wide spectrum of services from consulting, engineering, maintenance and after-sales to full-service projects. To date, over 1,000 industrial installations have been realized in the United States for leading automotive and agricultural machinery manufacturers and for the chemicals sector.

In addition to surface finishing, green engineering has been growing in importance for our Crystal Lake operations. Stricter environmental and climate-control regulations and the need to upgrade production plants have prompted companies to seek new technologies. A Boston Consulting Group study published in 2014, showed that business conditions for US-based manufacturers are increasingly attractive, and the country is the second most popular location after China. There are now end-to-end automated production processes in almost every industry. This, coupled with low energy prices, is driving many US businesses to expand and build new plants that keep manufacturing costs very low.

By stepping up research and the development of new technologies, the US manufacturing industry aims to extend global leadership in innovation. In this business climate, Eisenmann – located on the outskirts of Chicago – has the edge, thanks to its comprehensive offering of tailored solutions, locally based specialists, and customer-centric project management.





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Mark West
President of Eisenmann Corporation, Crystal Lake, USA

"To give our customers a competitive edge, we need to understand what is important to them. Aligning our resources with the US headquarters of our global customers helps us intensify collaboration and develop custom-made solutions, so that each of our customers can increase their productivity and efficiency. This approach allows us to play a significant role in their long-term strategic goals.

One of our main advantages is that we consider ourselves a global company that also has a strong local service and technical infrastructure to support our install base. When executing projects in the US, most of what we do is engineered by Eisenmann US and sourced locally. This also means that our work is not over once we have installed the customer's equipment, as we provide full service and maintenance capabilities for the life of the system. For large-scale projects, we have created the position of a Factory Service Manager, who acts as a local branch of Eisenmann on the customer's site. This service differentiates us from other system suppliers and enables us to build long-term customer partnerships."


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the best treatment?
With technology from Eisenmann.
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For more information, just contact us at:
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