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GLOBALIZATION Where Are We Headed?

“A NEW PHASE”

Economist Harry G. Broadman on networked world trade.

MADE IN ...?

The complicated path to a simple pair of jeans.

GRAPHITE AND CEDAR

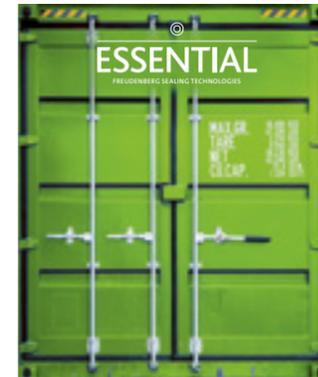
How Faber-Castell went global back in the 19th century.

the magazine **2_20**

IS THE WHEEL OF GLOBALIZATION
SPINNING BACKWARD,
OR IS IT GAINING MOMENTUM?



IN FIFTY WORDS



Globalization at a crossroads: 2020 is revealing how fully we are all networked globally – and how fragile supply chains can be. Is this the end of globalization? Or an evolution towards something new? Where are we headed? This edition deals with the nature of globalization, its opportunities and its multi-layered aspects.



Where Are We Headed?

An Essay by Claus Möhlenkamp, Chief Executive Officer,
Freudenberg Sealing Technologies

This year, globalization has moved to center stage again and ignited a debate over where it is heading – and perhaps where people are steering it. It's not easy to come up with an answer. It is worthwhile to take a look at the reality behind the term. Back in the 1980s, hardly anyone was using it. Its use only became more common in the early 1990s. But does that mean globalization has only been around for three decades?

In the mid-1970s, observers saw companies opening plants in other countries in a big way for the first time. The motives were largely different from those today. For many companies, they related to market access and resources – the issues today are often lower production costs and wages. Incidentally,

We turn to networks because we evidently see mutual benefits in international trade and exchanges.

Freudenberg set its sights on Japan in 1960 and began a close partnership with Tokyo-based Nippon Oil Seal Industry Company (NOK). At the time, Freudenberg was more interested in developing markets and new technologies than in cost-cutting. During this period, we also built up and expanded our manufacturing structures in Brazil. Our efforts mainly related to supply chains, even if we didn't call them that at the time. The company wanted to become less dependent on often unreliable long-distance sea transport.

By the way, you could set a date for globalization even earlier: for example, at the end of World War II when American products and mass culture began their triumphant march around the world. Or even back in the 19th century when the steamship, refrigeration and the telegraph created completely new opportunities for international trade. Or consider that Europeans were energetically pursuing ways to trade directly with China and India 500 years ago. Doesn't that push the basic notion of globalization back even further? Not to understate the flourishing world trade that already existed in Asia at the time. The Europeans definitely wanted a share of that commerce.

People haven't just started to recognize the mutual dependencies and connections that exist across continents. We aren't creating networks around the world just because advances like the airplane and the Internet are making them possible. We are building networks because we obviously see mutual advantages in international trade and exchanges.

Knowledge-sharing and economic exchanges around the world relate to value creation, raw materials and competencies. The trends took on a new dynamic when the term "globalization,"

as already mentioned, was coined during the 1990s. One example can be seen in the European economic zone; other measures such as the dismantling of customs barriers contributed to the phenomenon. A growing number of bilateral and multilateral organizations emerged – as did the desire for agreed-upon standards to enable an even more straightforward exchange of goods and services. As a result, industrial standards have become widespread. So have environmental standards and, much more importantly, the benchmarks for occupational safety and the organization of work. The process cannot be reversed either. But why is that? The way that politicians, business people and especially scientists and other researchers – after some early difficulties – responded collectively to the pandemic, shared information and launched joint research projects provides just one more illustration of what is possible today through cooperation and networks.

Globalization is an opportunity. It takes individuals and entire societies along a path to a better future. We have largely lived in peace in Europe since the end of World War II, a period of 75 years, and globalization has made a contribution to this. It creates transparency for progress and innovation. It facilitates communication. It has the potential to manage conflicts and find solutions to problems that have no boundaries. This applies equally well to combatting a virus and to the fight against climate change.

Still, peace, prosperity and growth cannot be taken for granted in our global, networked world. Individuals, societies and companies have to exert their influence and actively shape the changes. It is a positive sign that growing numbers of people have access to education, healthcare and a role in their

economies. Yet negative developments need to be corrected. We have to find a new balance between social, ecological and economic progress. This will only succeed with a large, networked community of nations. I am confident this will happen. The past has shown that economic progress and new technologies have created more jobs than they have eliminated. The printing press, the power loom, the assembly line and the computer – all of these technological advances have ultimately promoted the well-being of humanity. ©

Globalization is an opportunity. It transports individuals and entire societies into a better future.

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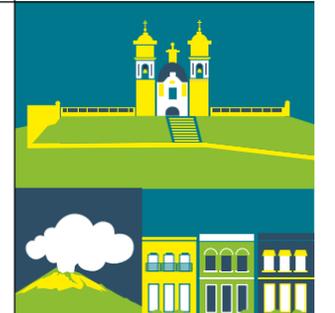
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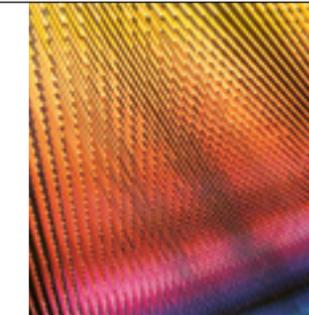
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A Suitcase Full of Pencils

Faber-Castell was already positioning itself globally back in the 19th century.



Gentle Invasion

About 30 years ago, a new species of bee arrived in Puerto Rico, possibly by cargo ship. Its origin was traced to a Brazilian breeding program. Researchers crossed the mild-mannered European bee with a more aggressive African variety of the same species that was more resistant to disease and better suited to the tropics. The new breed escaped in the 1950s and spread throughout the Americas. Unfortunately, it proved to be extremely aggressive... until it reached Puerto Rico. The bees developed milder traits on the Caribbean island 20 years after its arrival. U.S. researchers proved this with a genetics study in 2017. But why the transformation? Probably because Puerto Ricans eradicated the more aggressive bees selectively, giving the island a gentler yet hardy variety. ©



Broad Horizons

Japanese Prime Minister Shinzo Abe did it. So did former U.S. President Bill Clinton, along with Instagram founder Kevin Systrom. They all spent a portion of their university years abroad. Abe in the United States, Clinton in the United Kingdom and Systrom in Italy. As a study from 2017 shows, today's business leaders can often look back at an experience of this kind. Thirty-two percent of the chief executives at 231 of the world's largest companies spent at least one semester of their student years far from home. This was most common for business leaders from Africa (65 percent). Students' interest in venturing abroad has been an ongoing trend. In 2019, 1.1 million foreign students enrolled at U.S. universities. About 500,000 of them decided to study in the United Kingdom, and a similar number in China. ©

WORLD
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Global Discourse

When people around the world turn their attention to Davos each January, the World Economic Forum is the attraction. A veritable “Who’s Who” of business, science, politics and society gathers in the Swiss mountains. This neutral terrain has offered an ideal space for informal discussions since 1971. The goal of the gathering is to generate a feel for the state of the global economy and political situation, along with possible developments. The organizers shore up the program with research reports, support international cooperation and promote ethical conduct. The Davos credo is to speak with one another, understand one another, and improve the world in the process. On the other hand, critics complain that there is too much talking and too little action. For them, the forum is an insular, elite affair. ©

“Globalization Is Entering Its Next Stage”

Veteran international investment and trade practitioner, Harry G. Broadman, is convinced the pandemic won't reverse the course of globalization. An interview on how COVID-19 will alter the world's system of network trade, business practices and cultural relationships.

AS THE PANDEMIC OF 2020 HAS SO VIVIDLY REVEALED TO US...

That's right. We have seen the way business executives and consumers were completely caught off guard when China shut down parts of its economy and ripped supply chains apart. Much of the globalized economy is not visible at first. That's the subtle part. Globalization has permeated our habits, even though it might not always be obvious. Our consumer behavior has changed, and so has our culture.

SO WE SHOULDN'T LOOK AT GLOBALIZATION PURELY FROM AN ECONOMIC STANDPOINT.

Not exclusively. That is the conventional use of the term because we mainly look at products and services. But products and services will both change cultural habits. Right now, we are doing this interview over Skype, a program from the United States that has spread around the world. Technology has an impact on culture and can expand it: I am speaking from America. You are sitting in Germany. We could speak just as easily with people from Mongolia. We can see how other countries work and think, what makes them tick. I think human understanding and relationships have to grapple with these forces.

HARRY BROADMAN, IS GLOBALIZATION A MUCH OLDER PHENOMENON THAN WE THINK?

In part, that depends on how you define “globalization.” It isn't new from a historical perspective. Global trade and investment in goods and services has been around for more than two centuries. And, it is constantly evolving. As a result of the pandemic, but also due to other forces – political, technological and demographic – globalization will enter a new phase. We might describe what is now occurring as Globalization 4.0. It will become more complex and more subtle at the same time.

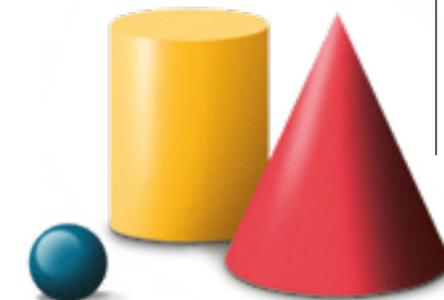
WHAT DO YOU MEAN BY THAT?

The global economy of the 21st century is a change from earlier phases. It is more complex because the supply chains for a number of products are both tiered and incredibly long. For even the simplest products, some may start with a component made in Brazil that is then transformed in Thailand and shipped over to China for additional modifications before they land in the European or American market as a final product. In the old days of globalization, you didn't have this division and layering of labor and production.



Dr. Harry G. Broadman

An expert in global investment and trade, antitrust, and corporate governance, Harry Broadman has worked in more than 85 emerging markets for 37 years: in private equity investment, PwC, the White House, the World Bank, the RAND Corporation, and Harvard University's faculty. He is a partner at Berkeley Research Group LLC, an expert witness international dispute and business strategy firm, and on the faculty at Johns Hopkins University. He was educated at Brown University and has a doctorate in economics from the University of Michigan.



operations. So-called “forced” de-coupling won’t be easy. Nor may it actually make sense economically. It is myopic.

THE YEAR 2020 HAS TENDED TO STRENGTHEN THESE IDEAS.

Of course, it has. The pandemic is an aspect of a globally networked world. Although the planet has seen the Plague and other diseases, COVID-19 is probably the most widespread and comprehensive pandemic in world history. It shows that we are all part of one world. It’s not surprising that some people are coming to the wrong conclusion: “See? If we didn’t have a globalized world, this pandemic wouldn’t have taken place.” But it’s a misconception that the genie can be put back in the bottle. I understand the emotional response, but it’s superficial.

BUT ISN’T THAT MISLEADING AS WELL? WE THINK WE ARE MORE FAMILIAR WITH OTHER CULTURES THAN WE ACTUALLY ARE.

That’s correct. This is one of the side effects of globalization. It may give us a false sense of knowledge and comfort. Getting books, films or music from a country isn’t the same as visiting it. Incidentally, the reverse may be true: We can develop a mistaken feeling of mistrust because we are too ready to believe things about other countries. Or we equate a product with the population living in the country and turn up our noses because only cheap products supposedly come from a particular country. At the same time, we overlook the fact that we’re actually the ones buying such items.

CAN GLOBALIZATION BE TURNED BACK?

There are still people who think globalization is a fad. It is not. Globalization is not going to end. There has been criticism of globalization and its outgrowths in the discussions underway in the United States and Europe. The argument is that we have globalized “too much.” Especially where China is concerned, and our leaders will fashion policies to make us “decouple” from China. I know of many companies that trade with China or have invested there, and I have my doubts about the feasibility of government-induced de-coupling of business’



We can’t get the genie back in the bottle.”



HOW WILL THE PANDEMIC CHANGE OUR GLOBAL ECONOMY?

That depends on how quickly it is contained. And how quickly we learn the correct health lessons. Nobody wants to shut the economy down, but we have learned that will be the end result if we respond too timidly beforehand. This won’t be the last pandemic that we go through. Perhaps it’s an indication that we need to cooperate all the more closely internationally on global problems.

DO YOU BELIEVE THAT THE NOTION OF LOCAL PRODUCTION, THAT IS, “LOCALIZATION,” WILL PREVAIL?

I don’t think COVID-19 is the end of globalization. Supply chains are becoming more complex, not less. Manufacturing is – and will still be – global. Companies seek to mitigate risks. Thus, when a supply chain breaks down, this will drive them to establish even more diverse supply chains. Many experts don’t seem to grasp this.

SO BUSINESS MANAGERS ARE SMARTER THAN MANY A SELF-STYLED EXPERT?

There is a distinction between an emotional response and a commercial calculation. A few months ago, U.S. President Donald Trump, by Twitter, ordered American companies to “come home.” Irrespective of whether that’s good or bad economic policy, many people don’t seem to understand how complex the web of business’ networks is today. Most



people only see the end product. They don't realize the full backstory and the intermediate steps.

IT WOULD AT LEAST BE A POSITIVE DEVELOPMENT IF THE PANDEMIC TAUGHT US ABOUT THIS, WOULDN'T IT?

I hope so. Politicians listen to the emotions of the voters. That's part of their job. Right now, when voters say, "We would like more locally grown food or more locally produced goods," you can meet their desires. But if they suddenly realize it's more expensive, some will look at it differently. I'm not being judgmental. It's just a striking example of why we should not make economic decisions solely based on emotions. An entrepreneur has to think in business terms. "Are there enough customers who are ready to pay the prices that I have to charge?" If that's the case, wonderful.

BUT THE DISCUSSIONS ABOUT "SUSTAINABILITY," NOT TO MENTION CLIMATE CHANGE, SEEM TO HAVE MOVED INTO THE BACKGROUND.

Yes, and the question is: Why? It certainly has something to do with the fact that the danger of the COVID-19 pandemic is more visible and immediate, and its consequences can be seen directly. By contrast, climate change lies off in the future, its harmful effects are incremental and a solution is much more difficult. The countermeasures against this particular disease are concrete: masks, physical distancing, and hopefully a vaccine. Getting rid of green-

house gases seems more complicated to many people, and the effect on individual countries is far more limited.

AT THE SAME TIME, BOTH CHALLENGES CAN HAVE A MAJOR IMPACT ON THE GLOBAL ECONOMY.

That's right. You could say that climate change is a kind of pandemic afflicting our ecosystem. Global warming raises costs for companies and for people. But these costs tend to be more hidden. That's the problem. Not much will change as long as no one feels they have been immediately and directly affected.

BUT THERE ARE ARGUABLY COSTS ALREADY.

Yes. But they are only being felt very slightly at this point, and people are ready to accept them. But the costs will rise exponentially. From this standpoint, the consequences of climate change are not really so different from those of a pandemic. In an article I published in the early 1980s, I made the case for higher oil import duties to curb demand for petroleum, the consumption of which generates hidden social costs. In many countries worldwide, and especially here in the United States, the price of gasoline does not truly reflect its full social costs.

IS ADDRESSING HIDDEN COSTS AN INVESTMENT IN THE FUTURE?

If we raise the price of certain energy products today, we may be able to help reduce the effect of climate change on our children. Call it a generational contract. And a globalization contract. There are quite a number of countries – including in Europe – where, because of government tax policies, the price paid for a unit of gasoline is already comparatively much higher today than in the U.S. That's a wise policy. As I mentioned, we all live on the same planet. We have to tackle global challenges together. ©



You could say that climate change is a kind of pandemic for our ecosystem."



Many countries of origin depend on the remittances of emigrants.



Refugees and migrants sent

\$554 billion

US to their homelands in 2019.



Bringing Hope Across Borders

Migration and floods of refugees are not a creation of globalization. But they have reached historic proportions. They have an impact on the societies in the old and the new homelands and have generated huge flows of money.

Benjamin Bakircioglu was just 17 years old when he left home in the 1970s. A member of Turkey's Christian Assyrian minority, he came from Midyat in southeastern Turkey. By leaving, he was able to avoid military service. His destination was Sweden, an obvious choice. Sweden had comparatively open migration policies, and Assyrians from Turkey and elsewhere in the Middle East had already settled there. Södertälje, a city near Stockholm, became his new home.

Sweden ranks third behind Germany and the United States as a center of the Assyrian diaspora. Refugees from the Syrian civil war have fueled the growth of the Assyrian community. Tens of thousands of Syrians of other faiths have also come to Sweden, following their predecessors who made their homes in the country decades earlier. According to the World Bank, one statistic from 1916 especially reflected the close ties between Syria and Sweden that migration and the flight of refugees had forged: \$19 million U.S. That was the value of the remittances flowing from Sweden to Syria. They were only exceeded by transfers from Middle Eastern countries, the U.S. and Germany.

Financial Transfers as an Economic Factor

Remittances have become important economic factors for many countries. In 2019, they totaled \$554 billion U.S. – a sum triple the amount of all governmental development aid to them. In Tonga, Haiti and South Sudan, the payments from migrants and refugees represent more than one-third of their gross domestic product. Similarly, several ex-Soviet republics are dependent on remittances from Russia. The financial transfers take place at the level of families. The money from abroad either finances the migration of other family members, or it helps them manage their everyday lives back home.

In the destination countries, migrants and refugees frequently work in low-wage industries or under precarious employment circumstances. While women often work in home care or as domestic help, men are often in demand as construction workers. They send part of their wages back home. The money serves as a kind of insurance for the recipients while relieving social tensions in the country. The funds pay for school tuition and supplies of medicine, for example. At times, it even finances the creation of fairly small businesses. There are fewer school dropouts and higher birth rates in some countries thanks to remittances, according to the World Bank.

Popular Migration Corridors

Remittances on a grand scale also reach the Philippines, India, Mexico and other Latin American countries. These countries are the starting point for so-called migration corridors that empty out in the target country. In 2017, the destinations for the two largest corridors were the United States and the Arabian Peninsula. As millions of people from Mexico, Cuba, the Philippines and El Salvador tried their luck in the United States, many millions from India, Pakistan, Indonesia and Bangladesh were drawn to Saudi Arabia and the United Arab Emirates.

The financial transfers help to pay for school attendance, medicines, the startup of fairly small businesses or the migration of relatives.



The United Nations calculates that there were

272 million

migrants worldwide in 2019.

In the Philippines, there is a government-backed system to prepare Filipinos for the international labor market, teaching them skilled trades and domestic skills. The idea is for them to earn money abroad or work as a crew on ships. A full 10 percent of the country's population have taken this step. But there are problems: This economic model can impede the country's own development and children often grow up without parents. With the wage cuts and job losses due to the pandemic, labor migrants and refugees have especially suffered. So have their relatives back home. The World Bank estimates that remittances for 2020 will be down 20 percent.

Assyrian Sweden

In all, 272 million people live far from their homelands today, according to the United Nations. That is 51 million more than in 2010. The number of uprooted individuals and families include 80 million refugees, even if many of them are seeking shelter elsewhere in their country. About 26 million have fled abroad, just as Benjamin Bakircioglu did years ago. He is now one of about 30,000 Assyrians in Södertälje. More Assyrians live there today than in Turkey, one of their points of origin. One in three residents of the Swedish city has Assyrian roots. They have their own web TV station and two soccer clubs. One of the two, Assyriska Föreningen, was co-founded by Bakircioglu. The club has made it to the top Swedish league at times and into the championship finals in 2003. Benjamin's son Kennedy played for the club before he achieved legendary status at neighboring Hammarby IF. He has also made the leap onto the Swedish national team and has worn the blue and yellow jersey fourteen times. That was certainly not something that Benjamin Bakircioglu could have imagined when he left for Sweden in 1976. ©



ESSENTIAL – THE SIM CARD



A section on things that are so universal that people often don't even see them. They are nonetheless extremely important. Just like a seal.

In the past, people traveling abroad often made their first stop at the currency counter. Today, they look for a mobile telephone shop – to obtain a SIM card from a local provider. Invented in 1991, the SIM card had a ground-breaking effect, making a mobile phone contract no longer dependent on the device. The development was known as the “Subscriber Identity Module,” and it ensured that users could retain their mobile identities. The first

ones were as big as credit cards. Then, as the downsizing trend caught on, they went from the mini-SIM to the micro-SIM, all the way to the nano-SIM. But the shape, function and contacts of these embedded chips remained the same for 25 years. Now the card is finally going “virtual” with the eSIM. It eliminates the need to make a switch when traveling abroad: From now on, users can look for the cheapest rate on the Internet. ©

A photo of COVID-19 taken with an electron microscope. The response to the pandemic is a vivid example of cooperation on international research.



Stimulating Knowledge Worldwide

Knowledge and science are a main element of globalization. Global networks lead to direct exchanges of ideas, and a world facing common global challenges needs global research.



58,990

patents were filed in China in 2019, which was slightly ahead of the figure for the US for the first time.

Consider a German scientist working with a Dane and a Dutchman at a research institute in Prague – it sounds like a good example of international scientific cooperation today. But it’s actually the story of Johannes Kepler working with Tycho Brahe and Frans Tengnagel on astronomical research in 1600. Even 400 years ago, scientists knew that research cannot be constrained within national borders if they intend to make groundbreaking discoveries.

Trade Is Only Possible When Knowledge Is Shared

This insight is more applicable than ever in today’s world. The essence of globalization is that knowledge is shared and made widely available. Trade can only expand in the long term when new ideas and technological possibilities leap from continent to continent. Knowledge is automatically shared if communication takes place over established channels worldwide. In contrast to the self-image of 19th century colonial powers, who simply believed they were carrying their own knowledge out into the world, different regions of the world were inspiring one another even then. The trend has accelerated in the 21st century. When researchers today shed light on the historic role of knowledge, they are “highlighting a dimension that has been undervalued until now,” Germany’s Max Planck Society noted in a blog article. If you want to understand how to navigate the globalization process, you have to explore this transfer of knowledge.

Globalization also means the internationalization of science and ideas. Indeed, this is its most important aspect. The number of transnational collaborations has tripled in the two decades since the turn of the millennium. More than 20 percent of the scientific research papers today have at least one co-author from another country. The number of participating countries has risen as well. The Brazilian economist Eduardo da Motta e Albuquerque highlighted this trend in a study published in the scientific magazine *Scientometric* in 2008. “Many of the world’s greatest problems are global. In this respect, it is completely logical that global research is needed,” he wrote.

Competition Spurs Innovation

Most of these international collaborations have at least one researcher from the United States on the team, followed by participation from England and Germany. But there has been a crucial development: The scientific world, with its clear orientation to England and the United States, once had two anchors. Today, the Anglo-American powerhouses have been joined by a third: China has been the second biggest producer of scientific publications for a while, and the entire Asia-Pacific region is making major contributions to scientific projects.

It wasn’t just scientific publishing that a handful of countries dominated just a few decades ago. There was a similar situation in patent filings. But that has changed too, according to a 2018 study by the International Monetary Fund. The impact of Asia, among other regions, has increased tremendously in the patent arena. Competition spurs innovation. When it comes to scientific advances for the good of all humanity, copying ideas tends to be beneficial even if it is frowned upon. If you seize upon others’ successes, you can build on them and accelerate your own development. Globalization stimulates technological progress and the sharing of knowledge.

The corona pandemic has been an especially striking example of this. Never before have so many scientists from different disciplines worked in parallel on the same global problem over such a compressed timeframe. Solomon Hsiang, Director of the Global Policy Laboratory at the University of California at Berkeley, among others, has recognized this. “I believe that no human undertaking has ever saved as many human lives in such a short time,” he said in an interview with his university. Hsiang and his team provide direct evidence of the trend: They have published an in-depth study about cooperation on the pandemic. Incidentally, the team included researchers from China, France, South Korea, New Zealand, Singapore and the United States. As a pioneer in international cooperation, Johannes Kepler would have been proud. ©

1



2



3



1_ Up-and-down: Employees in Italy had to show a great deal of flexibility.

2_ Important for systems: Seal production in Pinerolo.

3_ Automation offers protection: Employees can maintain safe distances.



And Now?

Pinerolo, a small town in northern Italy, is a key location in Freudenberg Sealing Technologies' global network. It is almost a miracle that neither employees nor customer relationships have been harmed during the corona crisis.

A half-dozen semi-trucks, all gassed up and packed with freight, were parked in front of the factory in mid-March. It was purely a precaution against the possibility that the Freudenberg Sealing Technologies factory in Pinerolo, a small town near Turin, would suddenly have to close. Among other products, the plant makes valve stem seals. These are small parts, invisible to a driver, but no engine can function without them. In the auto industry, which does without large part stockpiles, the lack of a component can quickly lead to a complete production shutdown. The semi-trucks never left the plant since automakers never ran out of the parts. As the corona pandemic spread across most of Europe, most car and truck makers closed their factories. "While it was imperative not to cause a production shutdown at a customer's operation, it then became a challenge to wind down our own manufacturing operations and logistics," Plant Manager Andrea Giordano said. His colleague Daphne Giorgis, Manager of Customer Service, added: "That applied only to the manufacturers, however. We had other customers, in the service shops, for example, who were heavily dependent on supplies of replacement parts."

Pinerolo faced its next challenge in May. It was essential to ramp up production since some of its customers had announced they were reopening their plants. Since Freudenberg provides upstream products, its own factories had to open a week earlier. Employees and government officials had to be convinced that it was really safe to work in the plant. "It's true that the impact on the Turin region was comparatively low," Giordano said. "Still, we had to ease people's fears of being infected." This worked out as well, and production was launched as planned, although at a fairly low level.

Communication Instead of Detailed Planning

What's the secret behind this successful example of crisis management? An especially clever emergency plan? Claudio Zoppi, who is in charge of Freudenberg Sealing Technologies' operations in Italy, smiled. "In this kind of crisis, you can't take extremely detailed precautions. It would be crazy to try to foresee everything down to the last detail. Instead you have to make new decisions every day, and this only works with a team that communicates constantly." The most important crisis management tool by far is communication with the

customers, with employees, with officials, with the company headquarters in Weinheim, and naturally with one another. But at a minimum, the preconditions for good, open communication as well as for working together beyond the borderlines of departments can be met before a crisis.

That is exactly what has happened at Freudenberg Sealing Technologies in recent years. Zoppi assembled the managers of each division as part of the initiative “One Team One Heart” designed to rid the company of turf battles. “It worked like an inoculation during the crisis. Everyone got behind our common goals,” Zoppi said. For example, there are plenty of opportunities for conflicts over urgently needed resources during a crisis. But if you activate the potential for human solidarity, everyone wins. Several other Freudenberg managers confirmed that this was a success in northern Italy. But there is another more technical reason why the Pinerolo facility made it through the crisis with relatively few difficulties. For fifteen years, it has been much more automated than normal seal manufacturing operations. To be sure, even robots need human operators. But in a highly automated plant, it turns out to be easier to maintain physical distancing, which is essential to protect operators’ health. This is also true for the regional warehouse where

13 autonomous transport robots are in operation. “This technology enabled us to react faster to the new demands arising with COVID-19,” says Emilio Chiolerio, who is in charge of the warehouse.

More Intelligent IT

A change of scene to Weinheim: Sören Schmitz is in charge of global supply chain management at Freudenberg Sealing Technologies and was continually on the phone with his Italian colleagues last spring. The corona crisis kept him busy early on since some of the raw materials and parts used by Freudenberg Sealing Technologies come from China. When the virus reached northern Italy, the company had to react very quickly. A task force evaluated the risk of causing production shutdowns at customers’ plants and agreed on countermeasures. “We didn’t bring a single customer’s production line to a halt,” said Schmitz, who has long been working to improve the company’s response to crises. His goal: resilience. That’s what experts call the resistance of supply chains to disruptions. “We are actually well-positioned, with a relatively decentralized structure of production facilities and logistics centers,” Schmitz said. “But there is still plenty of potential that improved IT offers.”

As many Freudenberg customers closed their factories, they were no longer in a position to accept the products they ordered. They ended up back at the shipper as product returns. At times, there were 600 return shipments stacked up at the new central warehouse in Bischofsheim. In contrast to the major retail mail-order companies, the processes at an automotive or industrial supplier were not geared to handling large numbers of returns. There’s more: In some cases, customers’ SAP-controlled IT systems kept spitting out orders even though their production lines had been shut down for a while. A large number of manual corrections were inevitable. “You can never do entirely without them, but we ought to improve our simulations of the consequences of disruptions in the supply chain so we can prepare countermeasures,” Schmitz said. Work is underway on a suitable IT tool called “Sales Inventory Operations Planning.” It should also help to make warehouse efficiency more transparent. “This much is clear,” he said. “The cheapest warehouse is always no warehouse whatsoever. Resilience is first and foremost a cost factor. But even these costs can pay off.” If just one customer switches to a competitor because of a supply chain or production shutdown, it can cost a company dearly. ©



Not a single customer production line had to shut down worldwide.”

Sören Schmitz – Vice President Global Supply Chain Management at Freudenberg Sealing Technologies



NOW I’M TELLING YOU

Cargo Containers

“I am here.”

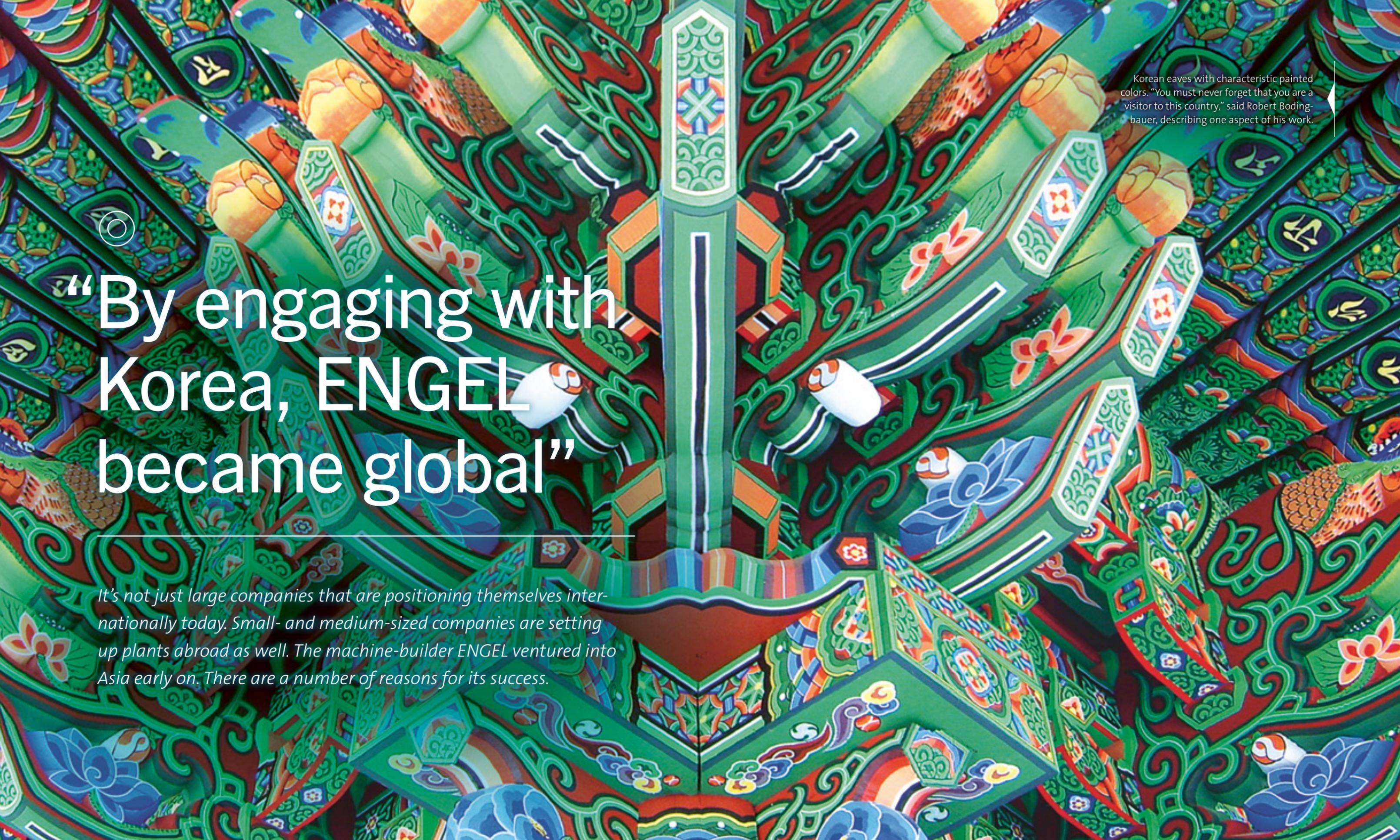
Do you know this guy Leonardo DiCaprio? I really don’t. But he is supposed to have co-starred in a film in which he stood on a ship and shouted, “I am the king of the world.” What nonsense. I’m not actually vain. But if anyone were allowed to call himself that, it would be my friends and I. We’re cargo containers. We drive globalization. Since the first standardized units began traveling the world in 1968, the global volume of trade has absolutely exploded.

We have sped up the transport of goods and made it less expensive. How? We are loaded just once and only reopened at our destination. We are like peas in a pod. We fit onto any container ship, any truck and any freight train. We are sturdy and can be stacked safely. Most of

us are like me – a 20-foot (6-meter) container. I weigh 2.3 tons and can hold another 30 tons. I’m a bit proud of that.

I like the fact that I go just about everywhere, although China lures me back again and again. After all, it has seven of the 10 largest container ports in the world. In 2018, more than 42 million of us paid a visit to the port of Shanghai. On the larger ships, I travel with more than 20,000 of my buddies. We are almost totally by ourselves on our voyages. Just a few people travel with us. Even in the harbors, much of the work is automated. No sooner are we off the ship and we are headed for our destination. I’m not choosy about the kind of cargo I carry. It has been everything from computers and furniture to sweet gummy ducks. ©





Korean eaves with characteristic painted colors. "You must never forget that you are a visitor to this country," said Robert Bodingbauer, describing one aspect of his work.

©

“By engaging with Korea, ENGEL became global”

It's not just large companies that are positioning themselves internationally today. Small- and medium-sized companies are setting up plants abroad as well. The machine-builder ENGEL ventured into Asia early on. There are a number of reasons for its success.



Evening atmosphere in Seoul, about an hour by train from the port of Pyungtaek, the site of the ENGEL facility.



You don't create trust from one minute to the next."

Right from the start, more than the Korean market was at stake. About 70 percent of the machines built in Korea are being exported to China and other countries in Asia. "Today, automakers with a global presence such as Hyundai and Kia use ENGEL equipment at their facilities worldwide," Bodingbauer said. Once you earn the trust of a company's headquarters, there are after-effects: "Plant managers at other locations see that our machine only needs a minute per shot during parts-making while another might need a minute and a half," he said. "A technological edge helps." ENGEL set up a plant in Shanghai in 2005 and reached revenues of more than 100 million euros in Asia for the first time in 2012. Today, Asia accounts for about one-quarter of the company's global revenue. Even Chinese auto suppliers manufacturing in Mexico for the American market have become ENGEL customers. "Globalization can't be stopped," he said.

The Hard Work of Building Trust

The Austrian company doesn't want to understate the difficulty of its early years in Korea. "You don't create trust from one minute to the next," Bodingbauer said. "Especially as a foreign company – we are viewed as such right

down to the present even if I'm the only European at the Korean plant today." Asia is a large, multifaceted continent, and his long experience in Hong Kong only helped him in limited ways. But he stressed that the Korea International Trade Association was quite helpful at the start. "Without them, we would've had much more difficulty with the many formalities." The second key factor was



Robert Bodingbauer

ENGEL dispatched him to Asia in 1986. He managed the company's newly formed Hong Kong office until 2003 and then took charge of the new ENGEL production facility in Pyungtaek City, South Korea. He and his Chinese wife live near ENGEL's Korean facility.



ENGEL Group

Machine-builder ENGEL manufactures injection molding machines and integrated system solutions for thermoplastics, thermo-sets and elastomers. ENGEL has around 6,500 employees worldwide, with 3,600 of them in Austria. It generates about 1.3 billion euros in revenue per year. ENGEL was founded in 1945 and has been wholly family-owned down to the present.

In the late 1980s, it was hardly normal for a small- or medium-sized company to venture into Asia. It was equally unusual for a 27-year-old to head its first subsidiary there, in Hong Kong, as it turns out. Robert Bodingbauer moved to the Far East as a young employee and has stayed there. Today, he is the Managing Director of ENGEL Machinery Korea. Several years ago, in recognition of his work, he received Korea's Presidential Citation Award, its highest civilian honor. Still, "we had a bumpy start," Bodingbauer recalled.

When Bodingbauer, who is Austrian, arrived in Hong Kong, he spoke little business English and found that it wasn't very easy to transfer money from Austria to Hong Kong. That was the case even into the 1990s. While things have changed, investments abroad are still a financial challenge for small- and medium-sized companies. Planning is difficult as well. "The right team is crucial. That is the cornerstone," said Bodingbauer, whom ENGEL appointed to run the plant in South Korea. It opened in 2001 and was the group's first factory in Asia. "A production manager, a sales manager and a finance chief whom you can trust – you have to arrange everything, even if you can't speak the language."

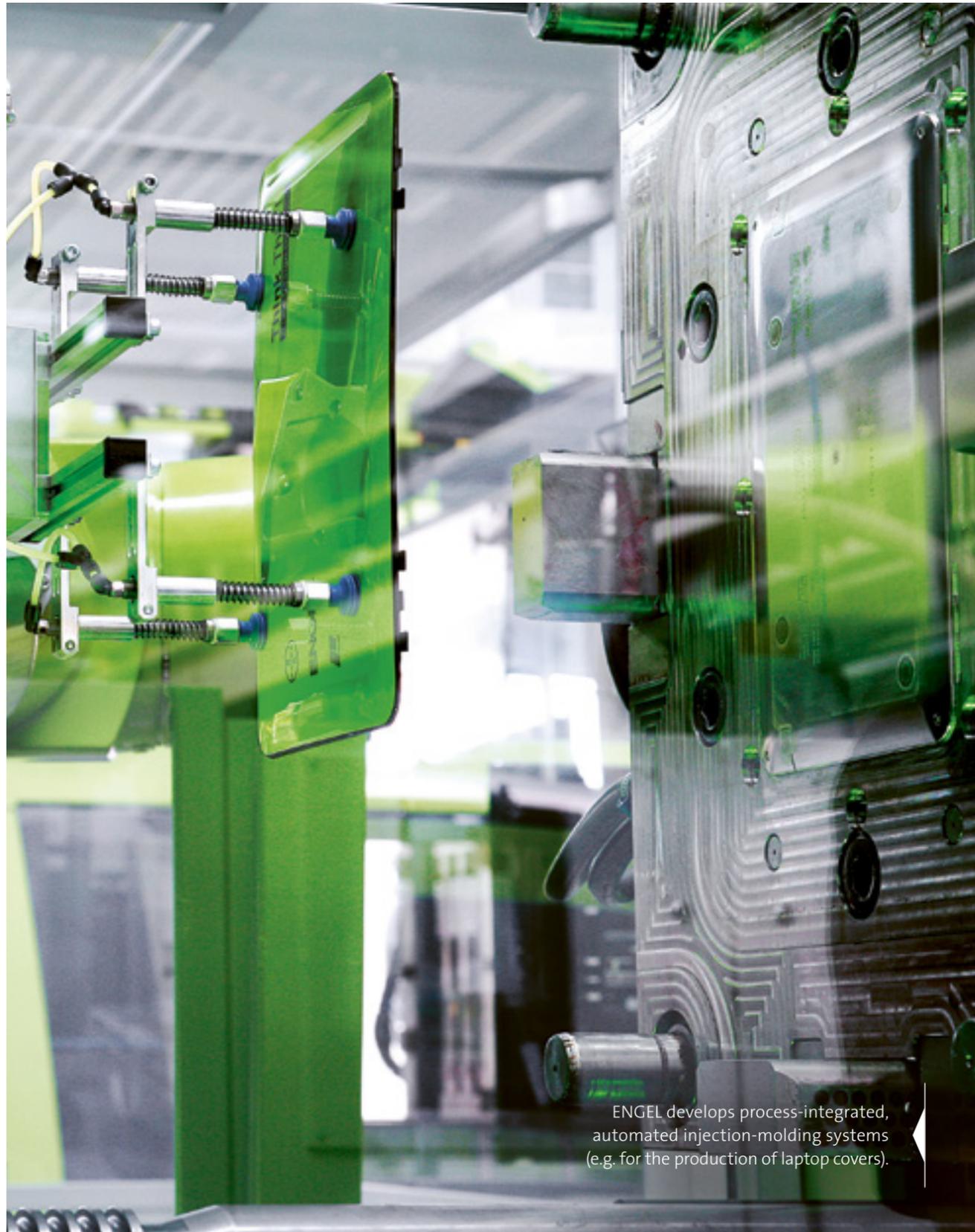
He apparently had a good feel for hiring and managing. Today his team has expanded to about 180 employees, including around 50 from the very beginning. Except for him, they are all Korean.

Indirect Impact on Headquarters

ENGEL deliberately set out to build machines in Korea with the same quality as those produced at its headquarters in Schwertberg, Austria. It builds injection molding machines and automation systems for the automotive and medical technology industries, among other sectors. "Some of our competitors wanted to have simplified machines built locally," Bodingbauer said. "It was clear to us that local manufacturers would always be less expensive anyway, so we had to leverage our advantage with technology." At the same time, the South Korean facility led to the company's involvement with streamlined production or "lean manufacturing," which had been employed in Japan for decades. "We were inspired – and we embraced it very early on," Bodingbauer said. "There was a powerful indirect impact on the entire company." ENGEL ultimately managed to attract major Korean companies, including Samsung and the conglomerate LS Group, as customers.



In 2013, ENGEL celebrated the expansion of its Korean plant along with customers, partners and local politicians.



ENGEL develops process-integrated, automated injection-molding systems (e.g. for the production of laptop covers).



To a customer in New Zealand, it doesn't matter whether the machine comes from Europe or Asia."

respect, he said. "You should never forget that you are a visitor in this country. You can learn about a host country and its business culture, but you have to bring your own respect for its culture and people." Not everyone is capable of that, Bodingbauer has observed. Globalization has no doubt changed South Korea. "Cultures are growing closer together, and the younger generation thinks differently than their elders," he said. Still, one should never assume that one's own cultural expectations and moral concepts apply abroad as well.

ENGEL's decision to apply the same quality standards in Asia as in Europe is based on respect as well, Bodingbauer said. The requirements for high-quality products and innovative technologies are above all growing in Asia. Countries such as South Korea, Japan and China are very open to robotics and automation, he added. ENGEL has long built large equipment and special machines at its Asian locations. "The production

costs are equivalent," Bodingbauer said. Local parts and more streamlined organization on-site make up for extra expenses such as customs duties and transportation costs for components from Austria. From the beginning, the huge edge over the competition was the shorter delivery times for Asia. "At times, we were six to eight weeks faster than the competition," Bodingbauer explained.

Spreading Risk for Customers

The corona pandemic of 2020 highlighted these advantages even more clearly. A debate is raging in some places about the risks to supply chains and "localization versus globalization." According to Bodingbauer, the discussions overlook a fundamental point: "We spread the risks for our customers. Our plants support one another." If the pandemic is hitting Europe especially hard, Asia can continue to produce and deliver – and vice versa. "To a customer in New Zealand, it doesn't matter whether the machine comes from Europe or Asia."

What counts most of all is the speed of delivery. If specific countries ban entry from certain areas, ENGEL may have a service representative who can enter the country from one home base or another. Bodingbauer then adds thoughtfully: "That is actually more difficult for our highly centralized competitors." He doesn't claim to have predicted global pandemics and complex supplier chains in 1986. But looking back, he thinks it was a good idea for the company to engage with Asia in a number of ways. "We are really well-positioned here." ©



Close Cooperation

Freudenberg Sealing Technologies provides sealing packages for ENGEL's hydraulic injection molding machines and is an important supplier of shaft seal rings to the company. Some of the concepts were developed in cooperation with ENGEL on an exclusive basis. Freudenberg also uses ENGEL products. Not just machines for multiple-component injection molding but automated systems as well, at the Application Center Integrated Precision Solutions in Losenstein and Emmerich, for example.



Made for Germany

As regional as possible, as global as necessary – Freudenberg Sealing Technologies Purchasing organizes global procurement along these lines. A look at a radial shaft seal ring made of the fluoro rubber FKM 595 reveals what this means in practice.

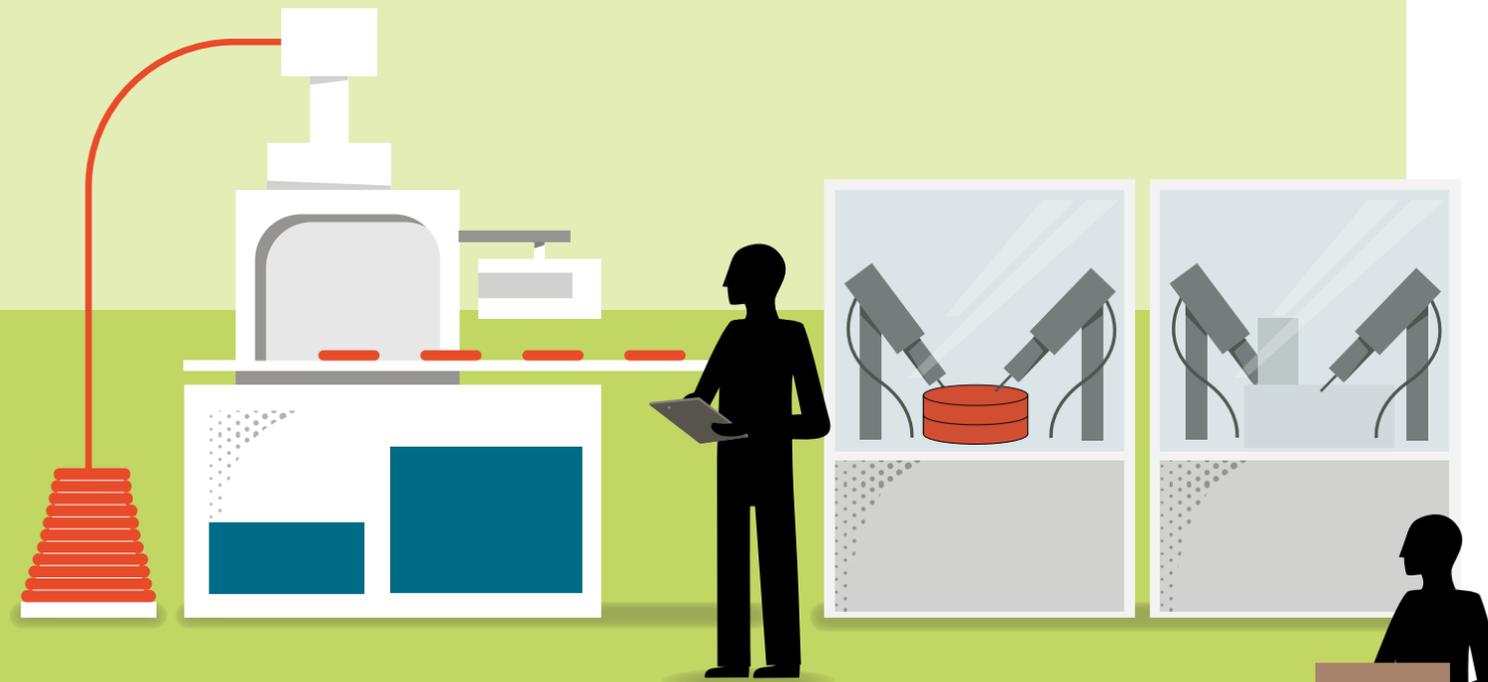
High-performance in every discipline: A radial shaft seal ring made of fluoro rubber combines extremely high temperature resistance and minimal swelling in lubricating oils. If the part also comes from a Freudenberg Sealing Technologies plant, it enjoys a reputation for a noble provenance throughout the sealing world. But there is a procurement operation with a global reach behind the “Made in Germany” seal of approval. The company is much like a five-star chef who prepares meals solely with the finest ingredients and the best professional tools. A peek inside the kitchen reveals where the key ingredients and utensils come from.

Belgium/Japan: Fluoro Rubber

Fluoro rubber is extremely important as a primary material to Freudenberg Sealing Technologies worldwide. That’s why the company is pursuing a “dual sourcing” strategy in which two suppliers provide technically identical material. This not only ensures relatively favorable procurement prices but also protects against bottlenecks during crises. Processed in Weinheim, the FKMs come from an American company that manufactures in Europe and from Unimatec, a wholly-owned subsidiary of Freudenberg’s partner NOK.

United Kingdom/China: Blank Equipment

A blank machine in Weinheim initially processes a fluoro rubber enhanced with other ingredients. The machine comes from a highly specialized manufacturer in the United Kingdom. The manufacture of the equipment became uncompetitive in the euro zone a few years ago due to Chinese counterfeiting, so the



British firm began purchasing machines in China and retrofitting them to meet European safety standards. Since Freudenberg has worked with the supplier for decades, it knows the exact requirements.

Italy: Equipment for Spring Production

The equipment that Freudenberg Sealing Technologies uses to make steel springs comes from Milan, a city with a long tradition of machine-building. The springs ensure the seal’s proper fit over its entire operating life. As with many specialized machines, there are only a few vendors that compete with one another – in this particular case, Europe has exactly three. The Italian machine builder offers the best value for the money and has worked with Freudenberg for more than 20 years.

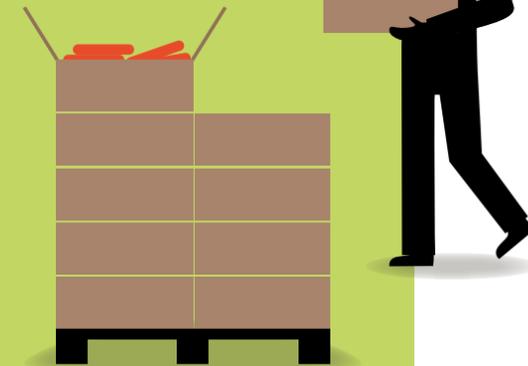
Germany: Injection Molding Machine

Radial shaft seal rings can be produced using an injection molding process instead of blanks. In that case, however, extremely high precision is required.

The mold is one example. “Made in Germany” comes into play here as well: The machines that Freudenberg Sealing Technologies uses come from tranquil Neustadt-Ferndal, north of Koblenz. The company is not just a supplier but also a partner in the ongoing development of production processes.

St. Leon Roth/Heidelberg: Packaging

The cardboard packaging material used in Weinheim and Reichelsheim comes from the local region. There are technical as well as ecological reasons for this. First of all, cardboard containers basically should not be transported over long distances so they don’t absorb moisture during handling. Secondly, local procurement allows the logistics to be designed economically and in keeping with good climate practices. ©





The Continent of Globalization

Africa is rarely mentioned when people discuss globalization. Even then, it is thought to be one of the losers in the game. In reality, the continent tends to be ahead of other regions when it comes to digitalization and its spirit of innovation. It has already derived benefits from the trends.



Hans Stoisser

Hans Stoisser, an economist, started working in Africa in 1982, staying for two-and-a-half years. Since 1992, he has headed the management consulting firm ECOTEC that advises ministries and communities in Mozambique, Uganda, Cape Verde and South Africa. In his book, "The Black Tiger" (2015), he shed light on the other Africa that Europe has not been inclined to acknowledge. He organizes instructional trips to Nairobi, among other destinations, and blogs at www.hansstoisser.com.

A dismal picture of Africa prevails in many industrialized western nations. It is seen as the continent of crises, catastrophes, disease and wars, to the point that its image obscures many remarkable characteristics, according to Hans Stoisser, an Austrian economist and corporate consultant. A keen observer of Africa for decades, he knows how other Europeans typically view the continent. "In the slipstream of globalization and digitalization, things have happened in Africa that we have not yet seen in Europe."

It all began with communication. Much as modern communication shaped globalization throughout the world, Africa's starting shot was fired when mobile telephones began making inroads around the turn of the millennium. "At that point, hardly anyone outside the continent understood that countries considered to be backward actually need mobile telephony," Stoisser said. It's not the first time in history that a lagging region has been able to leapfrog a stage in technology. Telephones have even proven to be more important than electricity since they simultaneously revolutionized communication, electrical supplies and payment processes.

Aviation Office plan to study their operation on site. “The special technical challenge is for drones to find their way. On the other hand, the catapult launches, parachutes and containers are actually simple technologies.” The American company Zipline has now expanded into Ghana and, with the outbreak of the corona pandemic, is giving the green light for the use of drones in North Carolina.

Mobile Money Conquers the World from Africa

In Kenya and other nations, the mobile telephone soon became a way to make payments. “You could easily pay the market lady for your bananas by telephone,” Stoisser said. It was the origin of mobile money. “It was a storybook innovation. It involved testing and learning. It was easy to do, and you could gradually build on it.” The approach was so successful that the large, global companies’ only option at some point was to export the system to other countries.

The French wireless company Orange is an example. It has mobile money operations in a dozen countries and now proclaims that it has the “first 100 percent mobile online bank” in France, “They are implementing what they learned in Africa – naturally adjusted and with some differences,” Stoisser said.

The same thing happened with cargo drones, another innovation. People marveled at them when they were deployed in Rwanda. A few special circumstances promoted their introduction there as well: a comparatively sparsely settled area, coupled with the need to transport medications to physicians in remote locations. The drones, which jettison packages of medicines by parachute, are operated so expertly and easily that European organizations like the German Federal

Fewer Legacy Rights, Less Headwind

Many African countries have another edge over Europe and America: “There are fewer legacy rights, less old technology, fewer rules. That means innovations can emerge more easily,” Stoisser pointed out. This has created very active startup scenes in many large African cities, launched and driven by a class of young, internationally networked business people, some of whom have attended universities abroad. In this respect, they resemble the globally oriented youth in other cities of the world. In turn, the developments have led people from countries such as Germany to participate in the activities, according to Stoisser. “You find many interesting people doing exciting things.” He sees great potential for these efforts, especially in e-government, e-health or digital insurance. “Of course, it helps if an innovator has a real opportunity to have an impact on the rules.”

For example, a new way to obtain electricity emerged during this flurry of innovation. It relies on solar panels to provide enough electricity to power a television or meet the needs of a modest household.

The system is connected to the phone network, not the electrical grid. Payments are made via a built-in SIM card. “Thanks to this off-grid solar-energy system, a special business model has emerged especially for poorer households in East Africa,” Stoisser explained.

Future Markets for Those Who Think Globally

Stoisser is a passionate advocate for the continent, arguing that Europe should pay attention to developments there and follow China’s long-standing example by identifying its business opportunities. On each business trip that he has accompanied to the continent, right down to the present, he has seen travelers get their first understanding of the contrast between image and reality in Africa. He says the events of 2020 present the best possible proof that Africa is integrated into global networks. In response to the corona pandemic, it is heading into its first true recession in a quarter-century. “The corona pandemic is basically not a health crisis here — it is an economic crisis that is severing African countries from global supply chains and other economic connections,” Stoisser said. But even if the coronavirus is slowing once-dynamic economies, “there are economic opportunities, markets of the future and above all growing markets in Africa if you think long-term and globally.” ©

1



Kenya

Kenya contributes about 40 percent of East Africa’s economic output. It has a dynamic private sector, a growing middle class and a committed civil society. Nairobi, its capital, is known as the “Silicon Savannah” and is considered a hot-spot for digital innovation with a lively startup scene. In recent years, the Kenyan economy has grown 5 to 6 percent annually. Its challenges include high population growth and youth unemployment.

2



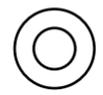
3



1_ Payment by telephone. It worked in the Kenyan market, too.

2_ A zipline drone drops medicine in a red box out of the air.

3_ Painted wall advertisement in Kenya explains mobile payments.



How Global Am I?

There is hardly a country in the world that closes itself off completely to the global community. But how well are individual countries actually globalized and how can this be measured?



What do you think? What country is rated the most globalized? China, the economic power? Not even close. In an unimpressive showing, the country ranked 80th. The United States, the global power? No. It only made it to 23rd place. Perhaps an up-and-coming city-state and financial center like Singapore? A bit better, but even the Asian tiger only came in 20th place. The nation that actually tops the list of 197 countries has no seaport and doesn't even have a city with a million people. It is Switzerland.

More Than Just the Economy

These findings are from the latest Globalization Index published by the Swiss Federal Institute of Technology (ETH) in Zürich. The creation of the index, first published in 2002 and reissued annually, falls under ETH's Swiss Economic Institute (KOF). The researchers don't work with the latest data. For example, the index from 2019 is based on data from 2017. That means inferences about the current U.S. political situation and the impact of Brexit cannot be drawn from the information yet.

The methodology behind the KOF Index differentiates it from other globalization rankings. The research team resisted the temptation to just consider bare-bones economic data. This is the most common approach, but they thought it clearly fell short. They determined the level of globalization using three aspects: economic, social and political. They looked at 42 variables while giving them different weights. From an economic standpoint, Singapore had the highest scores in the 2019 index. Luxembourg scored highest for social globalization, while Italy had the edge from a political perspective.



Basis for Evaluation in the KOF Globalization Index

The KOF evaluated each of the three following aspects based on factual data (de facto) and the country's framework of regulations (de jure):



Economic Globalization (Trade and Financial Streams)

Some examples: trade in goods and services, customs duties, taxes, trade restrictions, foreign investments, investment restrictions, capital account openness, investment agreements.



Social Globalization (Personal Contacts, Information Flow and Cultural Proximity)

This includes visa restrictions, tourism streams, migration, international airports, students and patent filings, trade and high technology, freedom of the press, access to the Internet, civil rights, gender equality, level of education, registration of international brand rights, number of McDonald's restaurants and IKEA stores.



Political Globalization

This mainly involves the number of embassies and international non-governmental organizations, membership in international organizations, conclusion of international agreements and participation in UN peace missions.

Europe Dominates

In the end, a mix of all three rankings determines the degree of globalization. This is where the "old world" dominates the list. Without exception, the top 15 countries are in Europe. In addition, except for Switzerland and Norway, they are all members of the European Union and are closely interwoven economically, socially and politically. The United Kingdom still belonged to the EU when the data was collected, and it landed in fifth place. Non-European states (Canada and Singapore respectively) first appear in the 16th and 20th spots. Something else stands out too: The top 20 largely includes relatively small countries. Fourteen of them have a population of about 10 million or less. The KOF researchers came up with this explanation: "Due to a high degree of integration, with neighboring countries, for example, small countries tend to be more highly globalized than large ones. In the latter cases, a large portion of the exchanges take place within the country."

But what's the reason for Switzerland's top ranking? The authors highlighted the country's high rate of foreign trade, bolstered by its export-oriented chemical and pharmaceutical industries. Switzerland also plays a prominent role in the global financial system as a banking center. Due to the many international holding companies that have their headquarters in Switzerland, the country is "closely interlinked with countries abroad." Switzerland also gets high marks as a multilingual country with cultural diversity, high income levels and a geographic position in the heart of Europe. Finally, many international organizations make their home in Switzerland (36 in Geneva alone), including the World Trade Organization and the International Red Cross. Known for its neutrality, the country is well-positioned internationally with a range of broadly-based advantages.

Global Cities

While the KOF closely examined the globalization levels of nations, other studies have zeroed in on cities. For one thing, they are considered agile. This gives them the opportunity to make measurable progress relatively quickly. The international consulting firm A.T. Kearney has been gathering data for its Global Cities Index for a decade, evaluating economic activity, human capital, information-sharing, cultural offerings and political engagement. New York and London scored

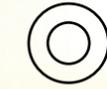
the highest in 2019. The authors are even giving London the best prospects for the future, ahead of Singapore, notwithstanding the uncertainty relating to Brexit. The British capital continues to represent "a coveted destination for direct foreign investment," and is particularly convincing in terms of innovation, economic power and governance. The index has a well-known urban expert, Prof. Greg Clark, supporting its conclusions. Clark says that London succeeded in attracting talent, investors and visitors from throughout the world even after the global economic crisis of 2008. This occasionally led to the development of new technological and scientific industries. You could put it this way: London, where an empire once flourished, is again the navel of the world. Will this apply to all of the United Kingdom at some point? The next KOF indexes will let people know. ©



The KOF Globalization Index 2019 (including the rankings)

<https://bit.ly/3jDkxbf>





“You Have to Understand Markets and Customers to Succeed”



Claus Möhlenkamp

The CEO of Freudenberg Sealing Technologies was born in Wildeshausen, not far from Bremen, in 1965. He studied industrial engineering with a focus on mechanical engineering and joined Freudenberg in 1994. He later served as Vice President of the Freudenberg NOK General Partnership Plymouth (USA) as well as Latin America. He has been the CEO of Freudenberg Sealing Technologies since 2011 and is responsible for strategic development, sales and marketing, as well as HR and communications on the leadership team.

Freudenberg Sealing Technologies had already forged ties in South America and Asia in the 1960s. Today, the company has a global presence, with 70 plants around the world. CEO Claus Möhlenkamp talks about locations, business responsibility and globalization as a positive force.

MR. MÖHLENKAMP, IN AN INTERVIEW IN 2019, YOU STATED: “WE ARE WHEREVER OUR CUSTOMERS ARE.” DOES THAT STILL APPLY IN A PANDEMIC?

We have continually cultivated our ties with customers during the pandemic. The communication is handled differently, but it is very effective and it involves the same spirit of trust. I even think that our exchanges have been much more intensive over the last few months. They have especially focused on production planning and the ability to supply our products. And yes, the statement still applies, even if the challenges posed by travel restrictions and hygienic practices are making direct, personal cooperation more difficult globally.

WHAT DOES THAT MEAN?

It means we set out into the world with our customers. Today, we are wherever our customers are at work in their respective markets and there is a need for our products. Our principle is “local for local” – manufacturing locally for the local market. For example, in China for China. The same applies to India, the United States or Europe.

THAT IS HELPFUL IF SUPPLY CHAINS ARE DISRUPTED.

It’s a huge help. So far, we haven’t had an interruption in customer deliveries. And our suppliers have continued to supply us. Even in the case of our internal supply chains between individual plant sites, there have been no significant disruptions.

YOU’VE TOUCHED ON SOMETHING IMPORTANT THERE: “FACILITIES” ARE A MAJOR ISSUE, ESPECIALLY SINCE THE CORONAVIRUS EMERGED. HOW WILL THIS ISSUE UNFOLD?

Having a range of facilities makes good sense in a globalized world filled with supply chains that are rather complicated. Our plant policy generally has two aspects. We are strengthening our customers and supporting them in their market. We also keep an eye on demographic and economic trends. Where are new markets emerging and increasing demand for our products and services? And where can we find a highly educated workforce? Of course, the outlook and our assessment will change based on our experience with the pandemic, and it already has, though perhaps less in the direct manufacturing environment. The change has mainly been in mobility and digital communication. The pandemic’s impact on manufacturing at Freudenberg Sealing Technologies has varied tremendously. The auto and aviation sectors, among others, have been hit particularly hard.



“We are wherever our customers have their respective markets.”



Personal contact cannot be replaced. It will still be part of our work in the future.”

WHAT LESSONS HAVE YOU LEARNED THAT GO BEYOND THE CORONAVIRUS?

Travel, in-person activities, personal contacts, trade fairs and major events have been key features of the past few decades. The pandemic changed that virtually overnight. We shifted to digital tools incredibly quickly. When I look back, it seems as though I have never worked any differently than I did over the last six months. For example, I haven't made an intercontinental trip since March. All appointments are scheduled online and carried out by video. This has all worked flawlessly from a technical standpoint and has been extremely efficient. Still, I made my first visits to production facilities as soon as the travel rules and the COVID-related limitations permitted. It's hard to describe how great it was to get together and meet with people in-person again. Nothing will replace personal contact. It will continue to be an element of our work in the future.

ARE YOU UNSETTLED BY THE GROWING TENDENCY OF GOVERNMENTS TO CLOSE OFF THEIR COUNTRIES?

No, although it is aggravating and hard to understand at times. In the past, there have been protectionist efforts and trade restrictions by individual countries again and again. As a company, we've been able to deal with them and adapt.

Think about the trade conflict between the United States and China. So far, Brexit has certainly been something of a unique phenomenon. There are military conflicts and natural catastrophes. We are an agile company and can make the adjustments.

DO YOU SEE MAJOR BUSINESS DIFFERENCES BETWEEN REGIONS?

Our business largely operates under the same assumptions worldwide. For example, our standards in manufacturing and for environmental protection, job safety and quality have been aligned worldwide over the last few decades. What I have observed is rather a clear shift in demand due to demographic developments. Asian countries, especially China, have been catching up and making enormous strides. The trend will continue to grow.

HOW IMPORTANT IS THE CONCEPT OF “CULTURE”?

Culture and language are tremendously important. That is another reason that we want to be on site locally. You have to correctly interpret and understand the market, customers and the entire economic environment to be successful. We do this operationally with local structures, processes and value chains, along with a sense of social commitment. This doesn't work with so-called “expats,” that is, employees whom we send to China or India, for example. We are proud of the fact that we've been able to fill all the management positions with people from the region.

IN YOUR VIEW, WHAT IS THE SPECIAL ASPECT OF GLOBALIZATION?

Let's do a thought experiment: What would the world be like if there was no globalization. We would have many small states with customs barriers, different currencies and legal requirements. There would be a range of conflicts, over raw materials, for example. There would also be more hunger, war and migration. We know all this from history. By contrast, global cooperation offers the opportunity to tackle humanity's problems that cannot be solved by a single player in a compartmentalized world. Climate change and the growing pollution of the environment are the types of issues that can only be handled as a community. On the other hand, there are countless positive trends. Today, many more people have access to health care, education, water and electricity than a few decades ago. That's the foundation for growing prosperity in many parts of the world. ©



More online:



Video of the interview:
<https://bit.ly/2SyxhnA>





Made in ...?

The manufacturing process for a pair of jeans leaps across national borders and includes a number of work steps. In this example, we highlight the countries involved in producing this global garment.*



1

Kazakhstan – Cotton

About 225 pairs of jeans can be produced from a standard bale of cotton (about 218–225 kilograms, or 480–496 pounds). That means a pair of jeans contains up to a kilogram (2.2 pounds) of cotton.



Italy – Buttons/Rivets

A classic pair of jeans has up to 3.6 grams (0.13 ounces) of rivets and 14 grams (0.5 ounces) of buttons.



Turkey – Spinning

Cotton threads several centimeters (roughly a couple inches) long are processed into cotton yarn in spinning mills.



Tunisia – Dyeing

Only the weft threads are dyed during the jeans production process. The warp threads run at a 90-degree angle to them and remain white. This gives jeans their typical appearance.



China – Sewing

Different seamstresses specialize in belt loops, pockets or pant legs, which speeds up production.



Poland – Indigo

The blue dye was once made from plants. Today, it is manufactured synthetically. Anywhere from 3 to 12 grams (roughly 0.1 to 0.4 ounces) is considered sufficient to dye a pair of jeans.



Taiwan – Weaving

During weaving, the weft thread runs across several warp threads and then passes under one of them, alternating frequently.

6

Switzerland – Lining

On average, about 37.5 grams (about 3.1 ounces) of lining are needed for the front pockets of a pair of jeans.



France – Washing

To give jeans a stone-washed look, the garments are washed in washing machines filled with pumice (from Greece, among other countries) before they are sold.



Generation Global

Twentysomethings are becoming more and more aware that the whole world is open to them. We turned to two of them to discuss their global life. In each case, it began with their participation in our TANNER program.

My family had welcomed “TANNER youth” from other countries into our home on several occasions. One of them was Carlos, who is from Mexico. We had an incredibly good time. He was even introduced to snow for the first time when he stayed with us. I traveled to the United States myself a little later. For an 18-year-old, it didn’t get any better than that. I wanted to experience things on my own and improve my English.

I stayed with a family in rural Kentucky. Everything was big there: the house, the cars, the refrigerator, the washing machine. The natural world was impressive as well. I took my first ride on a four-wheeler and caught fireflies. The TANNER program piqued my interest in another foreign stay, and I chose Mexico for my semester abroad. Carlos certainly played a role in that, since he had told me so much about his country. I had learned Spanish in the meantime, and Carlos’ family made my introduction to Mexican life easier when they invited me to stay with them a couple of days. Mexico is fascinating and the Mexican people are quite warm. But life is different there. They are satisfied with very little. I learned to appreciate things that we take for granted: hot water, a good health care system, and security. I lived near Puebla in a kind of gated community. I definitely benefited from my time there. It helps to be open to other cultures. The responses you get will be positive.

It’s cool to have friends around the world — I can thank my time abroad for that. The globalized world is very important to me. I now work for a company that does business around the world. We mainly speak English there. Our success is based on globalization. We benefit from our connections to other countries. I want to go abroad again but for a longer stay. This is expected of anyone aspiring to take on a leadership role at our company. South America would appeal to me. So would Asia. I don’t think the pandemic will really change globalization. I don’t think there is any way around it in the world of business today.

**LENA WEISS,
GERMANY**

stayed with a host family in the US in 2012. She later studied in Mexico, where she reconnected with Carlos, who had been a guest of her family.





**BENJAMIN GRANT,
USA**

spent two weeks with a host family in Germany in 2011 and his interest in foreign countries was aroused.

When I was 17, I spent two weeks in Weinheim, where Freudenberg is headquartered. The place is close to Heidelberg. To go abroad was a unique opportunity. I wanted to experience another culture all by myself. On top of that, I left North America for the first time in my life. Why I chose Germany? You should know that I grew up in Michigan, where cars are very important. In addition, I was already interested in engineering. Germany with its famous car makers seemed like a natural choice to me.

In Germany, I stayed with Yannick and his family. He was a year older than I was and had visited me half a year before. I was surprised how different Germany is compared to the United States. It felt like a more mature place, especially regarding the younger people. Yannick and his friends talked a lot about politics, something I didn't do that much in the U.S. What surprised me as well: Everyone spoke English. The U.S. doesn't do a very good job on learning foreign languages. I took Spanish lessons for a while, but I can't speak it at all. So, to travel half-way around the world to see my peer group speaking fluent English was amazing.

Another striking thing was that you just had to walk down the road every morning to get fresh bread. And in Germany, it is astonishing to see how long some places like Heidelberg have been around. In a nutshell, I pretty much liked everything. The TANNER program aroused my interest in other countries and cultures. It opened my eyes.

The globalized world is really important to me. I work as a manufacturing engineer and collaborate with teams in Germany, Canada and Asia. My company lives and breathes globalization on a daily basis and I enjoy collaborating with a lot of smart people. I definitely will look for projects abroad. On a personal level, I would like to see the world become united as one. From an engineering point of view, I would put it this way: In the long term, it will be good for the planet not to be that competitive. Let's share information across borders. ©



What Is TANNER

TANNER is the Freudenberg Group's international youth exchange program. It was developed for the teenage children of Freudenberg employees. Since 1999, the participants have had the opportunity to spend two to three weeks with host families who live at one of the Freudenberg Group's locations around the world.



Yūjō [Friendship]

A close partnership has linked Freudenberg and the Japanese company NOK for 60 years. Freudenberg Sealing Technologies has benefited from the joint development of key foreign markets right down to the present. What is the secret of this unusual alliance?

When Katsuhiro Yamaguchi moved to Weinheim for good in 1975, he began to lose a kilogram (2.2 pounds) a month. It took him a while to get used to traditional German cooking. But in his work, he adjusted comparatively quickly. He expanded Freudenberg's business in slide ring seals within a few years. The timing was perfect since European automakers had converted many of their engines from air- to water-cooling, and every coolant pump needed a slide ring seal. The know-how for this special type of seal came from Yamaguchi's homeland, Japan.

Slide ring seals were new to the German market. They were able to catch on quickly due to an unusual alignment in the history of German machine-building. In 1960, the Freudenberg Group acquired a 25 percent stake in a Japanese

seal manufacturer that was still called "Nippon Oil Seals Corporation" and now does business as NOK. Dr. Hans Erich Freudenberg, who then headed the economics department of the family-owned company, had spent several weeks traveling through the "Land of the Rising Sun" the year before. Japan was only beginning its economic development and was building about 190,000 vehicles a year. Germany's volume at the time was 1.5 million units. Dr. Hans Erich Freudenberg bet on Japan and won: In 2019, more than 8 million cars were built in Japan, and Toyota, which holds a stake of several percent in NOK, sold 10.7 million vehicles worldwide last year.

Freudenberg benefits from the arrangement far more than its minority stake might suggest. As Dr. Hans Erich Freudenberg wrote in the report from a

further trip in 1961, "We aren't expected to provide just technical processes and investments, but also the friendship, rapport and constructive criticism that ought to mark a close relationship between partners." During the early years, both Freudenberg and NOK concentrated on their respective home markets, and the cooperation was mostly of a technical nature. Still, the leadership of each company met at least once a year and held in-depth discussions. At the end of the 1970s, they had made it through the oil crises of the decade, and industry in both Germany and Japan underwent huge expansions. Freudenberg and NOK teamed up to acquire the Brazilian company Rubasil, their first subsidiary in a third country. With his production of slide bearings underway, Yamaguchi found himself serving as a translator when top executives met. "This wasn't

1



2



1_An intermediary between cultures: Katsuhiro Yamaguchi.

2_The signing of the agreement on March 15, 1960, at the Hermannshof (from left): Dr. Helmut Fabricius, Richard Freudenberg, Dr. Hans Erich Freudenberg, Shogo Tsuru, and Dr. Kurt Brasch.



It's not companies who befriend one another. It's managers and employees."

Katsuhiko Yamaguchi

just translation. It involved the interpretation of what was said as well," he recalled. If the Japanese side said, "We'll think it over," the Germans might often mistakenly interpret this as "yes." It was actually a polite way of saying "no."

At the end of the 1980s in the United States the German-Japanese partnership achieved a major success. Both companies had already built or acquired small local factories there, but they ranked low on the list of the top 10 seal suppliers. "The result was price competition that hurt both companies," Yamaguchi said. After in-depth discussions, the partners formed the Freudenberg NOK General Partnership in 1989. The basic idea was straightforward: Freudenberg would deal with Europe and NOK with Asia, and they would conquer the U.S. market together. At a minimum, the latter plan succeeded: The joint venture, whose shares are 75 percent owned by Freudenberg, achieved revenues in the high three-digit-million range in 2019 and has operated highly profitably. Significant segments of its revenue come from seals and other parts for automakers operating in the U.S. "We do good business with the large U.S. manufacturers as well as with German and Japanese OEMs that build cars domestically," said Matthew Portu, President of Freudenberg-NOK Sealing Technologies, which runs the U.S. business operations of Freudenberg Sealing Technologies (FST). "A major advantage of our global alliance is that we can deliver parts anywhere in the world with exactly the same quality," he said. This is especially

important because every automaker has the strategy of building powertrains from globally uniform modular kits.

Portu, who once worked in purchasing at Ford, believes that the successes can also be traced back to a blending of cultures. "Some of the stereotypes that we entertain are absolutely justified. Germany has very clever engineers and Japan is incredibly quality conscious. In our company culture, we combine the two, and add our very goal-oriented American management style." Weakened by the corona pandemic, the U.S. car market will pose major challenges in coming years, he warned. "It may be a long time before we return to pre-crisis levels." This is where the long-term orientation of each parent company will be needed, he said, adding that "our customers and suppliers recognize this as well." It also took stamina for Freudenberg and NOK to build up their business in China. Launched from Singapore in 1995, the 50-50 joint venture NOK-Freudenberg now operates plants in important Chinese industrial regions.

Meanwhile, Yamaguchi is long retired. Asked whether there can really be true friendship between business enterprises, he smiled, paused a moment, and then replied: "It's not companies who befriend one another. It's managers and employees. It is easier to maintain the friendship if each person has something to give." Then he changed the subject, pulled out his smartphone and displayed pictures of his grandchildren. "That's a good reason to stay around, isn't it?" ©

1



Freudenberg & Co. KG, Company Archive

2



1_ To mark FNGP's founding, Masato Tsuru, Joe Day and Dr. Reinhart Freudenberg (from left) planted a tree in 1989.

2_ Matthew Portu, President, Freudenberg NOK Sealing Technologies.

3_ Production in China: The joint company was launched in 1995.



Freudenberg & Co. KG, Company Archive

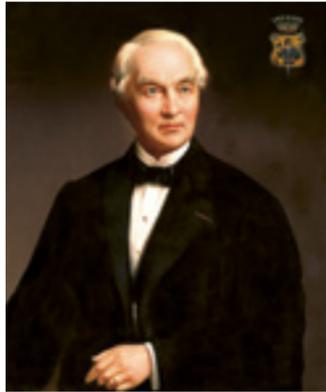
3



Into the World With a Sample Case

Globalization is not a new phenomenon. Around 1850, a businessman built a global sales network, procured raw materials from three continents and organized supply chains. But he had some help from reindeer. His product: pencils.

More than 32,000 color pencils adorn the ceiling of the Faber-Castell visitor center in Stein.



Baron Lothar von Faber
*1817 †1896

Globalization is not a new phenomenon. Around 1850, a businessman built a global sales network, procured raw materials from three continents and organized supply chains. But he had some help from reindeer. His product: pencils.

When Lothar Faber took over his parents' business in 1839, it was just a small pencil factory in Stein, a Franconian town just outside of Nuremberg. Within a few decades, he turned it into a global company – in the fullest sense of the term. It was an era when work on the Suez Canal was just beginning, Britain's Queen Victoria was just ascending to the throne, and steam engines were gradually finding their place in industry. It took 100 hours to travel from Nuremberg to Zürich, Switzerland, a length of time comparable to a global trip today.

“Paris, London, New York”

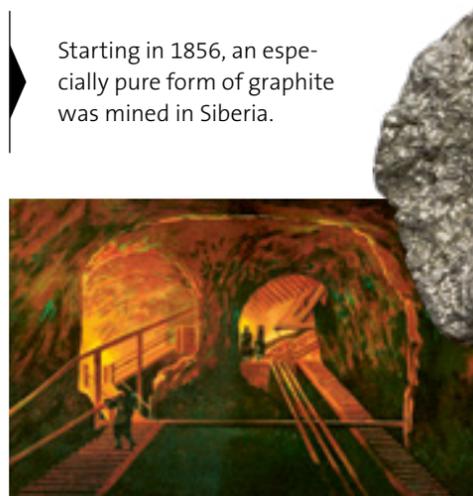
Pencils were an up-and-coming product, but competitors, especially from England, were achieving higher quality than the craft businesses around Nuremberg. As a young man, Faber went into training in Paris. “In this large, global city [...] I gained insights into the entire commercial world,” he noted later. He familiarized himself with global economic interrelationships and became a business traveler. As early as 1843, he traveled to St. Petersburg with a sample case full of pencils under his arm. He established sales subsidiaries abroad for the family-owned company. His brother Eberhard Faber was dispatched to New York in 1849, and locations in London, Paris, Vienna and St. Petersburg followed. Lothar Faber wanted to create a global business – “with the harmonious collaboration of the entire intelligence of the houses in Stein, Paris, London and New York,” he wrote.

He also understood that increases in sales can only be based on quality. In 1865, Eberhard Faber identified the right kind of wood in the cedar forests on Cedar Key, an island off the coast of Florida. The wood was processed in a sawmill and shipped to Germany. During the American Civil War, he decided to establish a special pencil factory in Brooklyn. Relatively cheap pencils were made there, and the more expensive products continued to be imported from Germany.

Graphite From Siberia

At about this time, a French businessman discovered graphite deposits of extraordinary quality in Siberia. This had a crucial impact on the quality of pencils since pure graphite leaves a darker mark and is softer for writing. Lothar Faber seized the moment, financed the mine and secured exclusive rights to it. The graphite was extracted in an inhospitable region and then transported thousands of miles by reindeer through pathless wilderness, before being loaded on ships or trains bound for Germany. The construction of the trans-Siberian railroad only began in 1891.

Today it may seem to have been an incredibly complicated investment, but it protected the company against fluctuating prices and allowed unimagined leaps in quality. The new “Siberian pencils” conquered the world market as a “pinnacle of uniformity, purity and unchanging hardness,” as an advertising brochure put it.



Starting in 1856, an especially pure form of graphite was mined in Siberia.



En Vente dans les principaux Magasins de Papeterie.
Exiger cette double Marque :
GRAPHITE DE SIBERIE DE LA MINE ALIBERT. — A. W. FABER MANUFACTURIER.



Faber-Castell

In 1758, journeyman carpenter Kaspar Faber set up shop in Nuremberg, where a number of pencil craftsmen were already located. The demand for writing instruments rose steadily in the coming decades, in part due to the introduction of mandatory school attendance. Lothar Faber, a member of the fourth-generation in the business, turned the craft operation into a global enterprise and “Faber” into a brand. Through a marriage into nobility, “Castell” emerged as part of its current brand name. Today, the company generates nearly 600 million euros in revenue and produces about 2 billion pens and pencils each year, making it the world's largest manufacturer of writing instruments.

1761

Carpenter Kaspar Faber goes into business as a pencil-maker.

1839

Lothar Faber takes over operations during the company's fourth generation, modernizes them and lays the groundwork for a global company.

1881

King Ludwig II elevates “Lothar von Faber” to a hereditary baronetcy.

1898

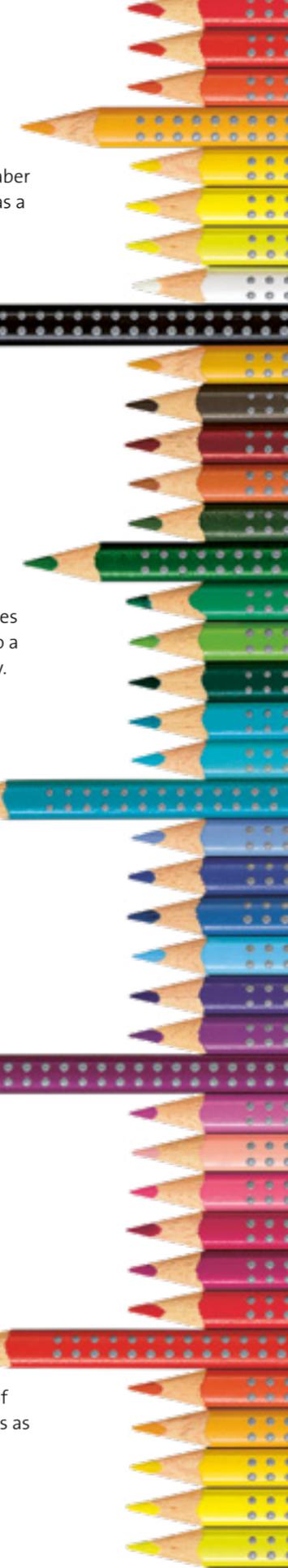
Count Alexander zu Castell-Rüdenhausen weds Ottilie von Faber. It is the beginning of the house of Faber-Castell.

1978

Faber-Castell Malaysia becomes the gateway to the Asian market. The plant in Kuala Lumpur becomes the world's leading manufacturer of rubber erasers.

2017

Faber-Castell achieves revenue of 667 million euros. 2017 still ranks as the best year in its history.





Lothar Faber opened a branch in New York in 1849; his brother Eberhard took over its management.



The Pencil

The earliest known use of graphite was in the Cumberland region of England, where shepherds used it to mark their sheep. Pencils, made of graphite encased in wood, emerged in the mid-16th century and proved superior to the quill pens of the era because they were easier to handle. British pencils were long considered the best in the world since the highest-quality graphite was mined from English pits. The commonly used term “lead pencil” is in part a result of the confusion of graphite, once a largely unknown material, with lead. The lead styluses used in ancient times and the Middle Ages also led to the misconception.

Bound for New Zealand, Argentina and Beyond

Amid all these efforts, Lothar Faber decided to have the company’s name, “A.W. Faber” (recalling his grandfather Anton Wilhelm), printed on the pencils, and the first branded writing instrument was born. Product catalogs, labels, pencil cases, and an expanded selection also emerged at this time – as did advanced production systems such as the roller mills used to grind the graphite and dyes to an especially fine degree. Lothar’s brother Johann, who would launch his own pencil company in his later years, took business travel to new heights in the 1880s, sending his staff on true global voyages, to destinations ranging from Sri Lanka to Australia and New Zealand, all the way to South Africa, Argentina and Egypt. “Pioneers and travelers from the Johann Faber company are active in every country of the civilized world,” a commemorative publication stated. The travel was by ship; it would be a decade before Otto Lilienthal made the first successful gliding flight. The first airline only crossed the Atlantic in 1939.

When Count Alexander von Faber-Castell, Lothar’s successor, traveled to New York by fast steamer in 1909, the arrival of the highly advanced ship was even worth an article in local newspapers – including the mention of the “pencil king,” as the businessman was known. The foundation for the success of the pencil-making enterprise based in the small town of Stein near Nuremberg had long been laid. Today, Faber Castell has around 8,000 employees, production facilities in 10 countries, and sales offices in 22. The wood now comes from Brazil, where the company has its own cultivated and managed forest. It all sounds very modern and global, and that’s what it is – just like Lothar Faber’s factories were more than 150 years ago. Globalization was even possible before the age of aircraft and the Internet. And you could always count on reindeer in a pinch. ©

Countermeasure against cheap copies: Lothar Faber produced pencils with names on them and turned them into a brand.



Blasting Past Boundaries

Globalization means competition. But it also encourages active information sharing, which promotes understanding and progress in both research and business.



A perfect example of globalized cooperation: a Soyuz rocket before takeoff to the International Space Station (ISS).



Anne McClain, Oleg Kononenko and David Saint-Jacques spent the first half of 2019 on board the ISS.

Scientists from 103 countries develop the experiments for the 58th ISS expedition.

Two years ago, a Russian, an American and a Canadian – Oleg Kononenko, Anne McClain and David Saint-Jacques – arrived at the International Space Station (ISS). It was a normal moment in a world that has freed itself of the shackles of the Cold War. The construction and operation of the ISS, which has now been manned for twenty years, has been a global joint effort. The space programs of Japan, Canada and Europe collaborate with their Russian and American counterparts. So far, the ISS has been a temporary home for space travelers from nineteen countries. Kononenko, McClain and Saint-Jacques were part of the 58th expedition to the space lab, and it took scientists from 103 countries to create the experiments just for that mission. Despite all the inter-country

disagreements, this kind of transnational cooperation works. An international division of labor and cost sharing allow participants to do valuable material research and gain medical and biotechnology insights. NASA is convinced there is a return of two dollars for every dollar that flows into space programs.

Joint Research and Publication

Transnational cooperation is proving to be fertile ground, especially for researchers. According to the Web of Science literature database, international co-publishing increased sharply between 2007 and 2017. In Europe, specialized texts and articles are now mostly written by authors from several countries. The figure rose from 28 to 41 percent in the United States and from 24 to 33 percent

in Japan over that period. Researchers' response to the corona pandemic is a good example of how they share their findings in papers, thus adding to everyone's knowledge.

Speakers from 100 countries have been announced for this year's World Health Summit in Berlin where the pandemic will be a topic of discussion. The meeting has been a platform for open dialogue for a decade. Conferences of this type are ideal for networking and announcing new findings. This is true for classic trade fairs as well. For example, the 2019 Mobile World Congress attracted about 110,000 visitors from 198 countries. Similarly, bauma, the world's leading trade fair for construction equipment and vehicles, hosted an extraordinary number of visitors – 620,000 from 200 countries – in Munich last year. A total of 3,700 exhibitors from 63 countries provided information.

Dismantling Borders, Broadening Horizons

Students are also seeking opportunities for international educational and cultural exchanges. In 2017, nearly one out of every two students at Luxembourg's universities came from abroad. The figure was almost one in four for Australia, and almost one in five for the United Kingdom. The European Union (EU) has been promoting foreign study for students since 1987. They become acquainted with a different educational environment and acquire everyday experience in a foreign country. The program is now open to trainees, interns and young entrepreneurs, so that 10 million young Europeans have pursued part of their higher and continuing education in other EU countries so far. International partnerships between cities are also creating spaces for exchanges and becoming more popular. Cities had formed about 20,000 of the partnerships by 2018.

In any case, the EU highlights the kind of benefits that multinational collaboration can bring. What began with economic and political cooperation by six countries in the 1950s has now expanded to 27 member-states. There have been no armed conflicts among them for 70 years. It has been the kind of peaceful era that had not been seen for centuries. Differences are resolved at the negotiating table.

Managing Globalization

Organizations such as the OECD also stand for global dialogue. Founded in 1961, its membership includes 30 countries that fund it. The goal: To increase growth and prosperity, fight poverty and manage globalization. It conducts studies and consults with governments, revealing shortcomings and pointing out solutions. The OECD has several thousand employees, many working abroad at its headquarters in Paris and in liaison offices in Europe, Asia and the Americas. This makes them a reflection of a global reality: Around 40 million people from OECD countries work abroad at another member-state.

One of the most innovative locations in the world – Silicon Valley – is a true melting pot. While 14 percent of the population as a whole in the United States was born abroad, the figure is nearly triple that in Silicon Valley. Mathematicians and computer experts are especially in demand. A full 65 percent of them come from abroad, as do 63 percent of the Valley's engineers. World metropolises such as London, New York, Tokyo, Singapore and Shanghai all attract top minds from around the world as well. For many people, it's normal to have a job abroad. And some choose a very special one. If everything goes as planned, one Japanese, two Russians and four Americans ought to be circling the globe on board the ISS right now. ©



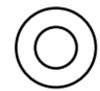
10 million

young Europeans completed part of their studies or further education in other EU countries.



40 million

people from OECD countries worked as expatriates in another member state.



At Home in the World

*Food. Lifestyle. Films.
Culture thrives on variety.
But if you're alert in
Morocco, Thailand or
Bulgaria, you will be
greeted by the familiar.*

McDonald's

Mc Who?

The brothers Richard and Maurice McDonald opened their first restaurant in California in 1940. They soon specialized in burgers, french fries, soft drinks and milkshakes. To serve their customers quickly, they simplified and sped up meal preparation. The approach caught on. More restaurants followed, each with the same fare and a familiar design. In 1955, franchisees began bringing the McDonald's principle to the rest of the United States.

Hello World

Canada, Australia, Germany, Japan: Under new corporate management, the restaurant chain began expanding internationally in 1967. McDonald's recognized trends early, and its menus delved into country-specific preferences. Food preparation and restaurant construction were standardized. Selection, quality and the customer experience followed the same pattern everywhere. When you step into a McDonald's, you know what you get.

It Worked

Think internationally, act locally. The franchisees' regional knowledge made it possible for McDonald's to succeed in a growing number of countries. For example, with kosher burgers in Israel, where cheese and meat are served separately, mutton instead of beef in India, and halal dishes instead of pork in Arab countries. ©



IKEA

IK Who?

Ingvar Kamprad, a Swede, founded IKEA in 1943. After four years in business, he added furnishings to his selection and later commissioned his own designs. In 1958, he began opening furniture stores and gradually merged typical self-service warehouses into them. IKEA proved successful with its simple designer furniture, affordable prices and neat storage ideas. IKEA also saved on service since customers assembled the furniture on their own. In turn, they enjoyed the feeling they were building something themselves.

Hello World

IKEA expanded into Norway in 1963. Japan, Germany, Australia, Canada and some other countries followed by 1976. Mass-production allowed affordable prices. Global product procurement made the furniture company independent. The simple design of its products appealed to customers worldwide. Outside of Sweden, IKEA stood for the Scandinavian spirit, which the names of the articles emphasized.

It Worked

After failing in Japan at first, IKEA succeeded with specially tailored furnishings. Due to the lack of a do-it-yourself tradition in India, IKEA offered to assemble its furniture. In China, IKEA lowered its prices and opened furniture stores near downtown areas. IKEA also courted young Chinese who leaned toward non-domestic brands. ©

Netflix

Net Who?

Reed Hastings and Marc Randolph founded Netflix in 1997. They lent out movies by mail at first. Soon they had their customers recommend films and developed a feel for their tastes. Today, they use Big Data, a result of their move into streaming in 2007. Series and films became available online. Partnerships with the makers of Xbox, PlayStation and Wii increased Netflix's popularity. In fact, many remote control units of Internet-capable televisions are now even equipped with the red-and-white Netflix button.

Hello World

Netflix went to Canada in 2010, and its streaming service is available worldwide today. With its range of offerings, it appealed to many younger consumers that hardly watched linear TV. Its own productions such as "House of Cards" set standards and won awards. They were seen as entertaining, exciting and willing to experiment. Social media created an echo chamber for Netflix, with a huge marketing impact.

It Worked

Netflix turned to country-specific productions. The streaming service produced series in more than two dozen countries and 17 languages. This allowed it to serve and bond with national markets, even as it kept its series' international recyclability in mind. Young, multilingual viewers in particular were receptive to the approach. ©





Duty-Free

Solar energy that can be tapped at will. Electricity from tides and waves. There are many ideas on how to exploit the forces of nature. But to make them a reality, engineers and scientists from different continents have to collaborate across boundaries.

Marc Röger does research in Tabernas, in the middle of Spain's Levante, a desert region that has often served as a backdrop for Western films. The sun shines an average of 3,000 hours a year here. At the other end of Europe, in the Orkney Islands off the Scottish coast, winter storms generate 20-meter (66-foot) waves. Neil Kermode works under harsh conditions here. "If you turn your back on the sea, it will kill you," he said. As different as the lives of the two men are, they have one thing in common: They are looking for new ways to convert the forces of nature into the kind of energy that people urgently need today: clean energy. And they are sharing their knowledge from one continent to another.

With Tides and Wind

Neil Kermode, a former naval officer, directs the European Marine Energy Center (EMEC), which was founded in 2003. It is basically a large test facility where creative engineers can test their ideas under real-life conditions. If you want to build turbines for a tidal- or wave-powered electrical plant, you can find a complete infrastructure here, especially sea cables and the obligatory connection to the grid. More than thirty companies from eleven countries have tested their equipment here. They range from giants such as Voith to small startups.



"We want to help make the use of tidal and wave energy just as competitive as offshore wind energy," Kermode explained. "It will take an increase in the size and reliability of the installations to do that." Most of the systems are still in the prototype stage, and commercial use, especially for wave energy, is still a long way off. Yet Kermode still thinks it makes sense to continue working on the technology. "The surface areas on land and off the coasts are limited. With wave energy, we are developing the open sea for the production of electricity." He pointed out that wave energy is in fact based on the wind, but in a far less volatile form. "You can create quite reliable predictions about the energy that the waves will have in three days," Kermode said.

Know-how transfers are promoted even when teams from different companies make their frequent stops at the few pubs in the region. "When people come to us, they are often completely focused on their inventions," Kermode explained. "But after a while, they recognize that there is a great deal of pre-competitive knowledge, for example, regarding corrosion behavior in saltwater." The EMEC encourages active know-how transfer as well. For example, the Scottish team recently began advising a Korean research Institute on the construction of a test center for tidal power plants. "If we want to exploit this energy, we have to create an entire industry," Kermode

emphasized. "That will only work when we cooperate worldwide and all sorts of people aren't trying to invent everything by themselves."

Concentrated Sunlight

Marc Röger, the fellow in the Spanish desert, supervises the "Systems" team at the DLR Institute for Solar Research and is working on concentrated solar thermal energy in Tabernas. Unlike the better-known photovoltaic approach, solar radiation is used to heat a fluid. Water is transformed into steam by the heat that is produced. The steam drives a turbine, which in turn drives an electric generator. In Röger's view, the major advantage is that this decouples the timeframes for the concentration of solar radiation and the production of electric current. "If installations of this kind are used on a grand scale, you don't have to worry about storage and grid stabilization anymore."



The sun shines
3,000
hours
a year in southern Spain.



The heat of the sun creates electric current: the solar platform at the CIEMAT research center.



If facilities like this are used on a grand scale, there will no longer be any need to worry about storage and network stabilization.”

Dr.-Ing. Marc Röger –

Team Leader Systems, German Aerospace Center
Institute of Solar Research, Qualification Almería

The technology, often called “concentrating solar power,” mainly holds appeal for arid regions. In 2009, the DLR escalated its know-how transfer to Africa, especially into North African countries. “This ranges from support for lecturers in universities to practical training at our test facility,” Röger explained. The cooperation with Moroccan partners is especially in-depth. The kingdom is pursuing a plan to use renewable sources to handle more than half of its electricity production. The solar thermal Ouarzazate power plant, which is partly financed by Germany’s KfW development bank, is considered to be an international showcase project. It has already demonstrated one of the technology’s advantages: While entire installations have to be imported in the case of photovoltaics, a large portion of a solar thermal system can be installed or produced locally. For example, heliostats, the mirrors that reflect sunlight onto an absorber, have been assembled and installed in Morocco.

Does it hurt German industry when a government-financed research institute transfers know how to Africa? “No,” Röger replies. “The knowledge must be broadly accessible if we want to enter into partnerships with these countries.” Only pan-Mediterranean partnerships enable Europe to establish stable supplies of energy totally based on renewables. Besides, European industry certainly isn’t walking away empty-handed. The steam turbine comes from Siemens Energy, and the hydraulics for the mirror adjuster from the Spanish machine-builder Hine Renovables, both customers of Freudenberg Sealing Technologies. ©



BY THE NUMBERS

178 Countries



The unrestricted transport of goods across national borders and continents is the poster child of globalization. Convenient personal travel to foreign countries is another hallmark of a world becoming more closely intertwined. Business travelers as well as tourists benefit from the fact that they need no visa for many of their stays abroad or they receive one automatically for a specified period as they cross borders. In early May 2020, citizens of United Arab Emirates were enjoying the greatest privileges in this regard. They were allowed to enter 178 countries* without having to obtain the prior authorization of the host country.

But it was a different world just two months later: The coronavirus created new realities. The travel restrictions announced by a growing number of governments had a huge impact on cross-border travel. The net result for citizens of the Emirates was that they could only travel to 91 countries without restrictions at the end of June 2020. A total of 14 nations were still requiring a visa. Due to the pandemic, the remainder imposed a temporary ban on arrivals into the country. ©

*Source: www.passportindex.org

July 2020

Optimized Heat Transfer

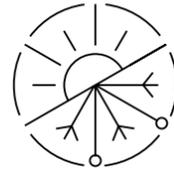
Seemingly contradictory features are combined in an innovative material from Freudenberg Sealing Technologies: It insulates electrically while conducting heat effectively. The elastomer is a silicone rubber combined with special fillers. The first tests on its use in electric cars are underway. The focus is on charging sockets, control units and batteries where heat must be drawn off as efficiently as possible. The new material maintains its characteristics across temperatures ranging from -50°C to 250°C (-56°F to 482°F). It is also deformable with relatively light force. When applied to a metallic surface, it fills tiny holes and adheres without additional surface

treatment. Yet another factor: The filler increases its heat conductivity significantly.

One automaker is already testing the first charging socket prototypes made of the silicone-based material, and a battery control unit for a hybrid commercial vehicle is in the testing stage. In that case, engineers turned to a three-dimensional formed part based on a silicone that enables direct contact with electronic components: Heat flows directly onto the housing. This thermally conductive material is also opening up prospects for optimized heat dissipation in batteries. ©

Unvarying characteristics
between

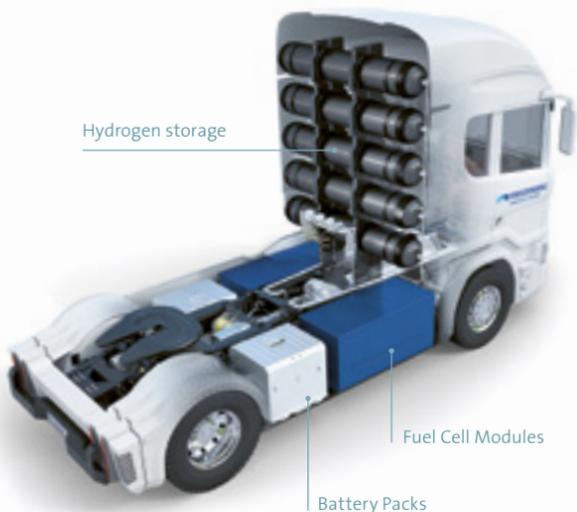
250 °C
(≈ 482 °F)



and
-50 °C
(-56 °F)

September 2020

Fuel Cells for 40-Ton Trucks



Heavy-duty trucks are in demand due to their large load volumes. Yet despite the latest advances, their fuel consumption and emission levels remain high. Fuel cells have now emerged as an alternative to diesel for long-distance transport. They also promise longer ranges and less costly operation than battery-electric drive. Working with the commercial vehicle retrofitter Quantron, Freudenberg Sealing Technologies is developing and manufacturing fuel cell systems for 40-ton trucks. The Bavarian state government is funding the project, and Freudenberg is contributing its material and design expertise on both the component and system levels. The first of several fuel cell trucks is expected to be on the road in mid-2021, undergoing tests for functionality, suitability for everyday use and system robustness. Fuel cells for trucks in continuous operation have totally different load and operating profiles than those for cars, with total operating hours up to seven times higher. The focus is on the longevity needed for real-life heavy-duty profiles so fuel cells will be able to challenge diesels' total cost of ownership. ©

June 2020

A Clever Combination

Less costly production and easier installation: Those are the advantages of a modular sealing design from Freudenberg Sealing Technologies. It combines a classic radial shaft seal ring with a plastic carrier instead of a more typical metal version. The solution meets requirements for long-term stability just as effectively as a metal carrier. The plastic version can be adapted precisely to the requirements for mounting on a particular machine and can be the same plastic as the housing. The seals are suited for small kitchen appliances, cordless screwdrivers, drones and mowing robots. ©



July 2020

Advanced Test Center

Freudenberg Sealing Technologies has opened its Engineering Service Center, an advanced testing facility for radial shaft seal rings, in the United States. The crucial reason for its construction was the rapid growth in demand from its North American customers. The center offers improved product quality and service, helping customers save time and money by handling complex tests and validations of sealing systems at the site. The solutions are used in everything from micro-actuators to maritime engines. The made-to-order tests provide fast results, which allows in-depth analysis. ©



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June 2020

High-Pressure Innovation

With support from Freudenberg Sealing Technologies, the Italian valve maker Bardiani Valvole is bringing out a "world-first": a high-pressure valve, certified under 3-A® Sanitary Standards for the first time, for hygienic applications. Its sealing system is partly credited for its groundbreaking benefits for hygienically sensitive equipment in the food, beverage and pharmaceutical sectors. Freudenberg Sealing Technologies came up with a new main rod seal that meets standards for high-pressure applications up to 150 bar. It consists of a seal lip (made of EPDM 302 or Fluoroprene® XP 43) and a backup ring (made of PTFE). Thanks to Freudenberg Xpress®, which employs turning and milling techniques, it was possible to produce the prototypes quickly and economically – without using molds. The solution prevents remnants of processing and cleaning media from forming deposits. It also uses materials that are heat-resistant and have outstanding mechanical properties. ©



High and Low

Highly flexible factory automation – known as “Industry 4.0” – was supposed to make manufacturing more attractive in Europe and the United States. So far though, only a few companies have moved production back from low-cost countries. Has something gone awry?

The net gain was 200 bolts of cloth and 125 barrels of wine. At the start of the 19th century, the British economist David Ricardo chose a graphic example to convey the merits of his theory of comparative cost advantage to his compatriots. If Portugal totally devoted itself to wine production, and England to cloth-making, and the two countries wanted to engage in commercial trade, labor productivity in each country would rise – and prosperity would increase noticeably. But consider something that Ricardo could not imagine: What would happen if human labor were no longer needed to produce cloth or wine?

With the advance of manufacturing automation since the 1980s, some industry sectors have approached this theoretical state. Robots took over increasingly complex tasks at high wage locations. But automation has a downside: It requires a major investment at the outset. Moreover, with their high flexibility, humans are far superior to fully automatic machines programmed for a specific activity if the work involves the manufacture of just a few products – or if they are extremely customized. That’s why highly labor-intensive activities have been moved to low-wage locations as globalization has progressed – from the United States to Mexico, from Western to Eastern Europe and more recently from Chinese coastal cities to the hinterlands. This migration has long seemed unstoppable. No company with competitors could afford to turn its back on the cost advantages that relocation offered.

Back to the Future

Then “Industry 4.0” came along. It was the vision of completely networked and highly flexible manufacturing. It was supposed to make automation profitable all the way down to a single batch from a single tool. Promoted for the first time at the Hannover Messe in 2011, Industry 4.0 was not only designed to improve the competitiveness of German industry – it was supposed to promote “reshoring,” that is, the re-transfer of industrial production back to high wage countries. Nearly a decade later, it’s reasonable to ask whether the concept has worked. Figures from the World Bank are unequivocal: In 2010, the production of goods accounted for a 20 percent share of Germany’s gross domestic product. The figure for 2019 was 19 percent. In the United States, where similar automation concepts were advanced as the “Industrial Internet,” the manufacturing share of its gross domestic product fell from 12 to 11 percent.

Fraunhofer researcher Jürgen Jasperneite cites some important reasons for the sobering interim results: “You simply can’t buy this kind of highly adaptable equipment yet. In addition, I have always wondered what products definitely require this capability.” The criticism comes from an authoritative source: Jasperneite launched the Smart Factory OWL in Lemgo in 2016 and is considered a leading expert on industrial automation. He sees the merger of information, communication and production technology as an ongoing process. “There has been no huge leap in productivity due to Industry 4.0 but rather constant improvement as new technologies are systematically implemented.”



It is still absolutely impossible to buy this kind of adaptable system today.”

Prof. Dr.-Ing. Jürgen Jasperneite –
Director of the Industrial Automation
branch Fraunhofer IOSB-INA

No Magic Bullet

The main purpose of the model factory in Ostwestfalen-Lippe is to support small- and medium-sized companies. Crowds of business owners and experts make their pilgrimages to Lemgo, look at demonstrations of new technological building blocks and have their own manufacturing operations analyzed to determine their level of maturity. Ideas for joint projects emerge again and again. For example, the researchers helped one manufacturer of electric drives develop a system to monitor the condition of his products from a smart phone app. Instead of grand visions, Jasperneite is also pursuing concrete projects with a practical artificial intelligence lab for automation and production that just went into operation. He also says any expectation of a magic bullet is misplaced. “A fully autonomous and adaptive production control system can be the icing on the cake in a competitive situation. But in many cases, humans are still the first choice.” ©

Feedback and Contact

Current And Fully Informed

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We look forward to a dialogue with you!

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