



DELIVERING VALUE THROUGH EXCELLENCE





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VALUE
THROUGH
EXCELLENCE

Excellence creates added value. In fiscal year 2016, Heraeus continued its concerted effort to implement programs and projects designed to improve the competitiveness and earning power of its businesses. And the effort succeeded: The measures are showing a positive effect. Heraeus has heightened its excellent market and customer orientation as well as its innovative capacity throughout the company and has boosted productivity in important functions and business processes. On the following pages, you can learn more about how this was achieved.

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Excellence creates added value

Operations Excellence was just the beginning. In the last 24 months, Heraeus has systematically launched excellence initiatives at all levels and in all functions across the company. Excellence is becoming part of the corporate DNA.

In his book “Hidden Champions,” management consultant Hermann Simon describes the strategies that globally oriented industrial companies pursue in order to achieve lasting success. Among the aspects cited in his studies, he identified several attributes these companies have in common. These “hidden champions” set very high goals for themselves and strive to be regarded as the benchmark in their markets. And although their businesses are often diversified, they have a strong focus on the relevant skills and deep expertise about structures and processes. In Simon’s view, however, these attributes are not merely goals; they are vital criteria for sustained success.

The essence of these attributes can be summed up in a single concept: excellence. Specifically, excellence at all levels of the company. “To ensure our long-term independence as a family-owned company, Heraeus must have profitable growth. This will happen only if we continually improve our processes and the performance of our businesses,” explains Heraeus CEO Jan Rinnert. “Other important success factors are a common understanding of management principles that focuses on performance, and a constant striving for innovation,” he continues. In other words, Heraeus must be at the forefront in all areas of its activity so that it can hold its ground against the competition. The company must operate with excellence across the board.

At the same time, excellence is not an end in itself; rather, it always serves a greater whole. In the case of Heraeus, the incentive is the independence that the

company wants to maintain through the shareholder structure and family ownership. And this is a long-term goal: Ultimately, the company wants to remain in family hands for its 200th anniversary in 2051 and beyond. “Therefore, excellence is not a short-term project that we will someday complete,” says Jan Rinnert. “The effort to take and hold the lead in all our activities must become part of our company DNA.” As a result, the idea of excellence can also be discerned in many rules set forth in the Heraeus Corporate Guiding Principles.

Giant steps

The pursuit of excellence was not always at the forefront for Heraeus. But changes in customer requirements, substitutes for precious metals, and digitalization are creating increasingly stiffer competition. Heraeus had to respond. To close the gaps, in 2015 the company introduced Heraeus FIT, a series of projects to make it more competitive. The goal was to quickly reach and, if possible, surpass the market standard. At the same time, the company launched a number of initiatives to instill excellence in all departments for the long term. A total of six different programs have the goal of broadly embedding the idea of excellence at all levels. Excellence in production processes was just the beginning; programs followed in purchasing, human resources, innovation processes, support functions and sales. The combination of short-term projects and long-term initiatives is paying off. The positive results of this development are evident in the improved key financial indicators for fiscal year 2016. Excellence has become a fundamental and lasting component of the Heraeus corporate DNA.

Procurement Excellence



Competitive prices, high availability and quality, and close cooperation with suppliers: As an integral component of the value chain, Procurement strengthens Heraeus' competitive position in many areas. Since the Procurement organization was centralized in 2014, intensive efforts have been made to promote excellence in purchasing through process standardization and automation, increased data transparency, and employee training.

Operations Excellence



World-class production: Since 2015, Heraeus has made vigorous efforts to modernize its global production landscape through the Operations Excellence program. A team of internal production experts has been providing on-site support for individual locations and divisions as they strive for further improvement. As a result, many of the Global Business Units were able to make their production areas more competitive in 2016. While the Operations Excellence initiative focused on German sites in 2016, it is being launched worldwide in 2017.

Innovation Excellence



Innovation was once again a focus topic at Heraeus in 2016; after all, innovation is essential for sustainable growth. The close connections between Development, Sales, and Marketing are especially important for successful innovation. Within the framework of the Innovation Excellence initiative, the company devoted a great deal of effort to strengthening those ties in 2016, as well as to promoting a culture of innovation. Heraeus' innovation culture is distinguished by an international focus, creative employees, a strong customer orientation, and global networking. The new Innovation Center in Hanau, which will open in September 2017, is a symbol of that culture.

Commercial Excellence



Commercial Excellence focuses on processes and workflows to improve marketing and sales activities within the Heraeus Group. The Marketing and Sales Board plays an important role, bringing together heads of sales from all business units. The board's responsibilities include defining standards for improving customer satisfaction and increasing profitability. They also make important decisions like establishing an overarching customer relation management system or uniform customer segmentation and the resulting market prioritization.

Service & Office Excellence



Since 2012, Heraeus has been working within the Magellan program to create uniform Group-wide business processes based on a standardized SAP landscape. The Magellan program plays an important role in achieving the goals established in the Corporate Guiding Principles 2020. It also provides the necessary basis for further digitalization projects in a number of areas. Additional Heraeus sites in more than ten countries went online with the new system in 2016.

People Excellence



Outstanding management, processes, and standards: With numerous projects and initiatives in such areas as talent management, employee development appraisals, and change management, Heraeus is introducing a consistent approach to HR management worldwide. To that end, it has established a modern leadership culture based on the Heraeus Leadership Model and is increasing the level of digitalization of its tools and processes. A wide variety of initiatives are helping Heraeus reach its growth targets and reinforcing the future-oriented focus of its business, organization and workforce.



»Our goal must be to hold a leading global position in all of our operating businesses.«

Jan Rinnert
Chairman of the Board of Management,
Heraeus Holding

Excellence is the key to long-term success

We continue to develop the Heraeus Group, making the company fit for the future.
An interview with Heraeus CEO [JAN RINNERT](#) about the current status of the company and the importance of excellence.

Mr. Rinnert, where does Heraeus stand in 2017?

JAN RINNERT: We have made significant progress in further developing the company over the last 24 months. Our business units are much more market-oriented, both organizationally and functionally; our innovation activities are more strongly focused and have accelerated enormously. With our Leadership Model, we have established a common global leadership culture that focuses on performance and results. Lean management, and particularly excellence, are now taken for granted as basic principles of what we do. All these measures have brought an increased positive

dynamic to the company. This is also confirmed by the key figures for fiscal year 2016, which were considerably better than those for 2015.

Why is excellence so important?

JAN RINNERT: First of all, excellence quite simply describes the absolute determination to achieve outstanding results in all our activities. To do this, we not only need our highly motivated and well-trained employees. We must also ensure that these employees are equipped with the means and the opportunities to do excellent work. This requires

transparent and quick decision paths through flat hierarchies, a superb work environment, and the necessary knowledge, as well as reliable decision-making through clear processes and rules of conduct. We are convinced that excellence across all departments and functions is the central key to sustained success.

What measures has Heraeus already introduced?

JAN RINNERT: We have launched various programs and projects in recent years that are moving us along our path to excellence. In our existing production areas, we implemented 25 optimization projects last year and schooled more than 800 employees in Lean methods at our Training Factory. At the process and IT levels, we are currently introducing a uniform Customer Relation Management (CRM) and Enterprise Resource Planning (ERP) system. We have already come a long way with the latter project. More than half of SAP users are already working with the new platform. In addition, we are now building a new Innovation and Communications Center in Hanau for our developers. This will enable us to fill our innovation pipeline even more effectively and introduce new products to the market more quickly. And in the coming years, we will open two state-of-the-art precious metals factories in Nanjing and in Hanau, constructed according to cutting-edge standards and following the latest workflows.

The interplay of all these measures is changing the culture within our company in a very positive way. Our employees are dealing more quickly and intensively with the challenges that arise.

There have also been some changes in the operational units. Could you outline these for us?

JAN RINNERT: At the start of this fiscal year, we completed the measures that were initiated in 2015 and continued in 2016 to realign the company's organizational structure and strengthen the functions of the Global Business Units (GBUs). We are now very well positioned organizationally, with eight market-oriented GBUs, one GBU for startup businesses, and the incubator platforms for developing new ideas. Our focus is now on fully tapping the potential that we see in our companies. At the same time, it is clear that we will continue to develop the organization of our

businesses and the Group's portfolio in response to changes in the market and competitive environment, as well as in our own needs and opportunities. Any other approach would mean no progress at all.

What additional steps have you planned?

JAN RINNERT: Heraeus should still be a family-owned company when it celebrates its 200th anniversary in 2051. This is still nearly 35 years away. If we are to reach this long-term goal, we must set the course now. Even today, we see how rapidly markets are changing worldwide, for example through digitalization or disruptive technologies. New competitors spring up. This means that we must constantly question whether our existing businesses still have the right business model and whether they are active in promising future markets. We must be prepared to respond with agility and flexibility to changing conditions.

This year we introduced the topic of organizational excellence to our managers worldwide. All of our businesses will more closely define their strategic orientation, building their organization and selecting the right employees accordingly. Our goal must be to hold a leading global position in all of our operating businesses.

This also entails the further development of our portfolio. Along with developing startups, we want to supplement our existing businesses with additional areas of expertise and technologies. By acquiring the remaining shares of Argor-Heraeus, we have taken a decisive step in this direction. Its expertise in gold and silver fits very well with the Heraeus Precious Metals expertise in platinum group metals. This makes us the world's largest provider of industrial precious metals services.

Where will Heraeus make future investments?

JAN RINNERT: Under the umbrella of Heraeus Holding, we manage a portfolio of different businesses that are extremely well positioned in their respective markets. We will continue to maintain this broad diversity. Diversification protects us from fluctuations in the individual markets. We invest only in fields that demonstrate attractive growth prospects. Conversely, we will separate ourselves from businesses that could grow better under a new owner. This, too, is a component of excellence.



As the Chinese economy continues to see strong growth of 6.9% in 2016, the market's needs for precious metal chemical products and recycling are increasing. That is why Heraeus is investing in a new precious metals plant in Nanjing, China, using the best processes in the world as well as the latest production and environmental standards. A team effort.

A high-angle, nighttime photograph of a dense urban skyline in Nanjing, China. The image is dominated by numerous skyscrapers and high-rise apartment buildings, many of which are illuminated with warm yellow and white lights. The sky is a deep blue, and the overall atmosphere is one of a bustling, modern metropolis. The buildings are packed closely together, creating a complex pattern of light and shadow.

**Teamwork
as a key
to success**



Catherine Wang
Purchasing Manager



Albert Joubert
Production Manager



Matthias Dornhecker
Project Manager



Dr. Daniel Zhang
Operations Director

Every Wednesday, around 30 employees from the core team gather around project manager Matthias Dornhecker. They are planning construction for the new precious metals plant in Nanjing, China. It is an extensive project that will continue until production begins in 2018. The new factory will significantly enhance the company's capacity to recycle precious metals and broaden the portfolio of chemical products. The new facility is a major opportunity for Heraeus in China.

"There are a lot of benefits to building a new greenfield plant," explains Dornhecker. "We are collecting all the best technologies and processes from Heraeus sites around the world for our new factory. In this sense, we are really creating a world-class plant." The new factory is equipped with the latest technologies. An advanced ventilation concept ensures high air quality for employees; insulated facades and plenty of natural light minimize

The new factory will significantly enhance the Heraeus' capacity to recycle precious metal products like catalysts.



energy consumption; and the high environmental standards exceed legal requirements. Even the materials flows throughout the entire plant are being optimized for short distances and efficient logistics.

As a German native, Matthias Dornhecker has been working abroad for many years. Since 2013 he bears responsibility for Heraeus' Group engineering projects. In 1994, he went to China for a long-term assignment for the first time and has lived most of his professional life abroad ever since. He finds it exciting to work in a country that is undergoing so many changes. "I can be much more involved and assist to shape things. In my role as project manager, I coordinate all activities within the project and bring the team together."

Daniel Zhang: »The plant will meet current and future business needs.«

Daniel Zhang is one of the project's members and has a dual role in the company. "As operation director for the current recycling site and also the future facility, I am deeply involved in every phase, from design to construction, to commissioning and operation yet to come." Joining Heraeus in June 2016 after working in operations of international chemical companies for more than 10 years, Daniel has been able to leverage his experience and know-how to make sure that the factory will meet business needs in future. He is especially keen to see through fresh eyes to find room of improvement in the designs.

"The new plant is like a chain. One single weak link will reduce the performance of the whole process. As a project team, everyone tries to utilize his and her strength towards the same goal. By working together, we are actually making a strong chain and striving to build an excellent factory."

Albert Joubert: »Automation is a topic near to my heart.«

Different from Daniel Zhang, Albert Joubert has been at Heraeus for 15 years. He helped to build the facility in Port Elizabeth, South Africa in 2002 and has been

responsible for the production of chemical products ever since. He has been supporting the project in China since 2016, contributing his extensive experience in building a new factory. “Our production in South Africa is 70 percent automated,” says Joubert. “We want to achieve the same goal in Nanjing. We are implementing the latest technologies and are developing standardized processes.” This will ensure the same results in every production run, reducing shortfall batches and processing time while increasing employee safety.

“We are creating something that has never existed before,” Joubert says about the team’s work. “It’s demanding but also an extremely satisfying experience.”

Catherine Wang: »The quality of our vendors is important for the performance of our new plant.«

Catherine Wang, as purchasing manager, has been working on the project since she was on board in July 2015. “I fully support our team’s goal of building a world-class factory. It is my role to ensure the quality of vendors’ services while keeping expenses within the budget. It is a huge project involving many vendors who help us to bring the blueprint into reality. Their quality, price and performance are very relevant to our desired success.”

For example, prices of iron and other building materials in China keep rising since October 2016, which poses challenges for budget control of the project. By working with legal and controlling colleagues, Catherine has managed to secure an agreement with the construction company to lock in a favorable price without incurring extra cost, which has helped to run the 100-million-USD project within budget.

Matthias Dornhecker: »The project’s success is the sum of many great ideas.«

Daniel Zhang, Albert Joubert, Catherine Wang, and Matthias Dornhecker are all experts in their fields. The project thrives on the variety of expertise, the diversity of nationalities, and the contributions of employees at all

experience levels. Matthias Dornhecker is proud of his team, and their team spirit encourages him. “Everyone wants to accomplish something, everyone is enthusiastic,” he says. “The project’s success is the sum of so many great ideas and that will help us create an excellent precious metals plant.”

Heraeus in Nanjing



In September 2016, Heraeus has begun construction on the world’s most advanced precious metal factory in Nanjing, China. The new factory will significantly enhance the company’s capacity to recycle precious metals, especially platinum group metals. In addition, the plant will increase the output of chemical products and precious metal colours. Amongst others, the product range includes homogeneous catalysts and covers solutions and salts based on precious metals.

Heraeus’ new precious metals factory is located at the Nanjing Chemical Industry Park and will open at the beginning of 2018. It will comprise an area of 84,000 m². The factory and office buildings are designed to apply and even exceed latest EHS standards, codes and regulations by all levels in the country.

With its advanced technologies, Heraeus will support China’s 13th 5-Year Plan (2016–2020) in innovation and green development, as well as socially: More than 200 highly skilled experts will be working at the new site by 2020.

OUR HIGHLIGHTS FOR 2016

JANUARY | CUSTOMER ORIENTATION

The **Magellan program**, an IT-based business process standardization platform, is launched at three sites in Germany. The program's largest rollout to date will connect over 2,000 of the 5,000 users around the world to the system.

MARCH | INNOVATION

Heraeus Photovoltaics establishes a regional product development laboratory in Tokyo, Japan – one of the most important markets for the PV industry.

APRIL | CUSTOMER ORIENTATION

Heraeus establishes a new company in **Korea** to better serve key regional customers, especially in the electronics industry.

APRIL | CUSTOMER ORIENTATION



The topping out ceremony for the **Heraeus Innovation Center** in Hanau. Approximately 200 employees from Research & Development will move into the building when completed.

MAY | CUSTOMER ORIENTATION

Heraeus Photovoltaics opens a new Research and Development center, the Asia-Pacific Technology Development Center (APAC TDC) in Shanghai, China.

JUNE | CUSTOMER ORIENTATION



Through its new technology partnership with Exmet, a Swedish startup, Heraeus expands its 3D printing portfolio to include the **amorphous metals** material group.

JULY | CUSTOMER ORIENTATION



Heraeus Electronics and the technology company Danfoss conclude an exclusive cooperation agreement to market the **Die Top System** – an innovative advance for power modules.

SEPTEMBER | INNOVATION



Groundbreaking ceremony for the new Heraeus Medical production facility in Wehrheim/Taunus. At 2,800 square meters, the eagerly awaited building expands capacity to support the above-average growth that Heraeus Medical is targeting in the years ahead. The total investment cost amounts to approximately €20 million.

NOVEMBER | AWARDS

Heraeus South Africa wins the **Eastern Cape Top Green Organisation Award** for outstanding environmental management.

NOVEMBER | AWARDS



The **Heraeus Awards** are presented for the first time, combining the Innovation Awards and HPS Awards, along with the new Best Commercialization Award.

SEPTEMBER | INNOVATION



Heraeus Precious Metals: Ground-breaking ceremony for the new Heraeus precious metals factory in Nanjing, China. The factory will meet the very latest production and environmental protection standards.

DECEMBER | CUSTOMER ORIENTATION

Heraeus sells its **global target businesses** to the Materion Corporation, a technology group headquartered in Mayfield Heights, Ohio.

OCTOBER | AWARDS



Heraeus ranks among the top ten family businesses in Germany: Heraeus receives recognition as a **Top 10 Family Business** from the Foundation for Family Businesses.

DECEMBER | CUSTOMER ORIENTATION

Heraeus expands its expertise in **platinum recycling**, acquiring VINO Plasma GmbH in Karlstein, Germany.



Purchasing 4.0

In Procurement, the data transparency is a vital basis for strategic decisions and negotiations with suppliers. At Heraeus, an innovative new software ensures that buyers like Monique Rieger can easily keep track of everything despite numerous different data sources. Artificial intelligence and modern language processing makes this possible.

»Where we were previously just an unremarkable mid-level customer, we are now supported as a global key account.«

Monique Rieger
Purchasing Manager Heraeus
Precious Metals



Profit lies in purchasing, at least according to the business maxim. Because as the logic goes, every euro that you don't spend lands on the bottom line. "In the past, the decentralized structure and systems at Heraeus often made it impossible to see where we were spending money," says Monique Rieger, purchasing manager of Heraeus Precious Metals (HPM). She also has global responsibility for purchasing chemical products. Even today, there are over 14 different purchasing systems in use at over 100 sites within Heraeus. In addition, each Global Business Unit (GBU) uses its own product groups, descriptions and serial numbers for the individual products. "Since the data was not compatible, it was extremely difficult to get an overview of our purchasing activities within the Group. Sometimes we were not even aware that different areas were buying the same product from the same supplier at different prices," Rieger recalls. This makes strategic decisions like joint selection of suppliers or joint purchasing in order to negotiate better terms difficult.

Better deals by using a wide range of data sources

Since 2014, Heraeus has been working on harmonizing its IT infrastructure and process landscape with the Magellan program. Procurement systems are being standardized as well. Yet the entire changeover will not be completed until 2019. "Too long, when you consider the savings – and other strategic advantages, too – we will lose during that time," says Dirk Witte, Chief Procurement Officer.

Working with the Italian software specialist Creatives, they introduced a solution in 2016 that can obtain an astonishing amount of information from the existing data for Heraeus buyers. State-of-the-art language technologies and artificial intelligence make it possible for the system to combine the data from all 14 systems currently in use – thus allowing the buyers to analyze it. What companies supply Heraeus in a product group worldwide? Do other GBUs buy the same product? What suppliers offer the highest discounts? "We could already generate Group-wide analyses after only a few weeks," says Rieger, "and use them to identify areas where we could negotiate more favorable terms."

Chemical products, for example: Using the data, buyers were able to get significantly better terms with a global

supplier, who had previously supplied Heraeus using a decentralized approach. "Where we were once an insignificant medium-sized customer at ten different sites, we are now considered a global key account," Rieger enthuses. Another colleague was able to use the data to renegotiate the global agreements with headhunters and to efficiently bundle part-time staffing companies in Germany. "By integrating the data, we can finally see where it makes sense to meet with the suppliers and to work out a better deal for Heraeus." The point is not always to get lower prices or more service: "Because we work in some industries with very few highly specialized suppliers, security of supply plays a crucial role," states Witte. In the future, buyers will be able to define much more effectively the number of suppliers we should be cooperating with in certain industries or regions.

Artificial meets human intelligence

Artificial intelligence makes it possible to integrate the data. But that does not mean that we can do that without human intelligence. "In the early stages, in particular, the system frequently asked when it was unsure," Rieger reports. Does the product description "automobile" always refer to the company car – or could it sometimes be a promotional gift for EUR 3.90? Each human response is translated into a rule that will be applied going forward when a similar situation arises. "Our system generated over two million such rules in the first four weeks alone, only a fraction of those with human assistance."

In this way, the software will – in a manner of speaking – make itself redundant over the medium term. Because in addition to the daily strategic analyses carried out by the buyers, it is also now being used to transfer data from the 14 legacy systems into the new, single SAP system. Does that mean it is only a temporary solution, even if a highly intelligent one? In the words of Dirk Witte: "Especially when it comes to acquiring new businesses, which Heraeus intends to do in the next few years, rapid integration of the procurement data and processes will be key. Our tool would speed up the categorization of different types of data so that we could utilize advantages quicker," Witte continues. "It just knows Heraeus too well already."

ENABLING CUTTING-EDGE RESEARCH

Innovations from Heraeus make excellent research and customer-oriented applications possible in many fields, often for the first time. This is evident once again in fiscal year 2016, with outstanding contributions ranging from improving a classic product to helping prove Einstein's theory of relativity.

The culture of innovation at Heraeus is distinguished by its international orientation and by creative and globally networked employees. The clear focus on customer needs and the conscious decision to look beyond the project at hand provide fertile ground for innovations. This combination of expertise and curiosity steadily delivers new ideas for developing solutions for a better future in exciting areas of application, including flexible touchscreens, electromobility, medical implants and even research in outer space.



Awarded: Best Innovation 2016

In 2016, the Heraeus Award for Best Innovation went to an American developer team from Heraeus Medical Components for the development of a spring coil guidewire design that offers significant improvement in clinical performance. With the new guidewire that is used to facilitate catheter implantation, Heraeus has developed a new kind of medical product for minimally invasive medical procedures. The coil-wound guidewire is made of a kink-resistant patented nitinol alloy. Guidewires enable the correct positioning of therapeutic catheter products within blood vessels for the infusion of medications directly into the heart. One major problem with traditional guidewires made of stainless steel is their tendency to kink or bend. The new guidewire technology from Heraeus eliminates this problem, taking the burden off doctors which accelerates treatments and reduces costs.

A new window on the universe: High-purity optical quartz glass proves Einstein was right

Albert Einstein's theory of relativity is no longer merely a theory. By supplying a super-high-tech material made of quartz glass for gravitational wave detectors, Heraeus contributed to the proof of Einstein's general theory of relativity. In February 2016, experts from the Laser Interferometer Gravitational-Wave Observatory (LIGO) announced their sensational detection of waves, which Einstein had postulated more than 100 years earlier, a discovery certain to be nominated for a Nobel Prize. Gravitational waves – "wrinkles" in the space-time continuum – are emitted by distant astrophysical events such as supernova explosions, neutron stars, and black holes. For its elaborate measurements, LIGO utilizes highly sensitive optical interferometers with perpendicular arms 4 km long. These optical instruments, which can measure very precise changes in length, are considered the most accurate "rulers" in the world. They contain Heraeus Suprasil® 3001 quartz glass, which boasts extremely high transmission values and optical homogeneity.



Printing digitally on glass with real gold for the first time

Precious metal colors have been part of the standard Heraeus repertoire since 1896. Heraeus was able to astound even in this traditional product segment in 2016, and the world of creative decorations is now richer by one innovation: With Heraeus Inkjet Gold, substrates such as glass or ceramics can now be printed digitally with real gold. Previously, industrial precious metals decoration was limited to direct screen printing, direct thermoplastic printing, or decals. Now, the liquid precious metal preparation can be applied to smooth surfaces, such as tiles or perfume bottles, in a digital printing process. This makes it possible to produce high-quality and sharply contoured finishes readily and with almost no odor. After printing, the products are fired at approximately 800°C, resulting in a lustrous gold film about 150 nanometers thick.



New carbon gives electromobility a boost

Heraeus is developing materials for energy storage in highly efficient high-performance batteries and supercapacitors, such as ones used in electric and hybrid vehicles. Porocarb®, a conductive, porous and finepore carbon powder, is revolutionizing battery technology as a functional additive that boosts performance. Porocarb can increase the energy density in batteries for electromobility while still maintaining their charging capacity. In pilot projects with customers, Heraeus has demonstrated that this carbon powder, when used as a battery additive, increases the storage density and performance of lithium-ion batteries by 20 percent – a veritable milestone for electromobility.



Conductive polymers make rollable and foldable touchscreens possible

Within the next five years, it may not be unusual to sit back and read the latest news on a rollable and foldable touchscreen, as curved three-dimensional displays become part of our everyday lives. Heraeus is accelerating the development of these touchscreens with Clevios™, a line of innovative conductive polymers. In 2016, researchers developed a flexible, fully functional 7-inch (17.8 cm) touch panel on a polyimide film substrate only 12 micrometers thick in collaboration with the Industrial Technology Research Institute (ITRI Taiwan). The research project yielded an improvement for the mass production of Clevios™-coated films. With this conductive coating, manufacturers can produce touchscreens with improved functionality on an industrial scale for flexible, curved, and three-dimensional touchscreens as well as wearable functional apparel, for example.



**Making
the right
connections**



Martin Sattler
*Heraeus Electronics,
Head of Customer Solutions*



Dr. Muriel Thomas
*Heraeus Electronics,
Head of Material Systems*

With Materials Solutions, Heraeus Electronics has created a department that further develops the company from a materials supplier to a solution provider. More than ever, the market is seeking system solutions and one reason is that the growing segment of power electronics is becoming more important all the time.

If we want to grow as a materials supplier, we cannot just supply materials,” declares Dr. Muriel Thomas. “We have to develop further.” Dr. Thomas, whose field is engineering, joins her colleague Martin Sattler in overseeing the new Materials Solutions department. As head of Material Systems, Dr. Thomas is responsible for all the technical aspects, while Sattler manages customer solutions, the marketing and business development of the new solutions.



Three questions for...

Dr. Klemens Brunner,
Head of Marketing & Sales,
Heraeus Electronics

What does the Application Center mean for Heraeus?

This area exemplifies the Group’s movement toward close cooperation with customers in resolving their specific problems and managing development projects. Furthermore, with the Application Center, Heraeus goes beyond simply selling materials and material systems; now we can also be a service provider. That’s evident in constructing prototypes as well as supporting the customer in the design and simulation of final applications in power electronics.

Is the Application Center a blueprint for the market worldwide?

The Application Center, as it was built here at the Hanau site, develops solutions for customers all over the world. But in fact, given the importance of the Chinese market, we are going to build another laboratory like this in Shanghai. People working there will be in a better position to meet the local demand for system solutions.

What role will cooperative projects play in the future?

A company that evolves from a materials supplier to a solution provider automatically moves closer to its customers. After all, close cooperation is the key to success in the development of complex customer-specific system solutions. This means that cooperative projects with key customers, to include jointly developing and marketing products, will be increasingly common in the future.

Sattler adds: “There’s not much room for innovation if you just focus on the material. But when you think about how the materials interact, entirely new possibilities open up.” In terms of the booming power electronics sector, this means that a company like Heraeus which manufactures solders, sinter pastes, bonding wires and metal-ceramic substrates and also has in-depth knowledge of connection technologies can offer more than just the individual components. And that is precisely why the Application Center was built at the Hanau site. Or, as Sattler puts it: “Materials Solutions is a strategic orientation that takes concrete shape in the Application Center.”

Tailormade modules for customers worldwide

At first glance, these look like quite conventional laboratories: gray ESD floors, 5S labels everywhere, clean-room lights on the ceiling. The space holds a wide array of head-high machines that look like the ovens in an industrial bakery if it weren’t for all the monitors, cables and microscopes. These machines are used to create the new connections, combining metal-ceramic substrates, solders or sinter pastes, semiconductor chips, bonding wires and casting compounds in precisely the right combination to produce modules perfectly tailored for each Heraeus Electronics customer.

These power electronics modules are ultimately used in a variety of applications, particularly in the fields of electromobility and renewable energies. For a provider of high-quality products such as Heraeus, it’s the perfect fit because high durability, reliability, and a long lifespan are the most important demands placed on the modules in these two fields of application.

Furthermore, electromobility and renewable energy production are experiencing a global boom. “As a result, our customers can’t satisfy the demand if they keep on making

»We cannot continue to be a product supplier if we want to grow as a product supplier.«

Dr. Muriel Thomas

»We are expanding our innovations portfolio by expanding into system solutions.«

Martin Sattler

everything themselves,” explains Sattler. “They need a supplier who offers more than just delivery of the materials. And that’s exactly who we are.”

To offer this added value from simulation to prototypes to low-volume series the team identified and systematically closed capability gaps, Muriel Thomas explains. “We expanded our machine park and also set up a laboratory for testing and qualifying the modules.” To obtain information about the reliability and lifespan of materials and connections, the modules are also destructively tested in the Application Center. This can be seen in the next room. Overalls, hoods and booties pulled over shoes are required in this laboratory as well, and the room is likewise filled with rows of head-high machines. Dr. Thomas explains: “Here, we test how high the operating temperatures can go before the systems fail, that is, when wires come loose or solders give way.” But the modules aren’t just “cooked.” They are also exposed to electric voltages and heat/cold, and their progress toward failure is even tested nondestructively using acoustics.

Increased diversity for better innovations

Instead of materials, Heraeus now offers booming markets around the world precisely tailored modules that do exactly what the customer wants. This is known as forward integration. Or, as Sattler puts it: “We’re not just selling materials, we’re selling solutions.”

But building the Application Center required more than merely investing in new machines or infrastructure. It also called for advanced training, as well as recruiting employees with skills that were not yet available within the company. And it involved changes to the work itself, says Dr. Thomas: “The diversity of skillsets and the interaction in common laboratories and workgroups – all of this leads to new ideas and innovations. This is a great example of how to overcome the silo mentality.” And as she looks out the laboratory window at the new Innovation Center under construction right next door, she adds: “I’m quite certain that this concept will take off there as well.”

New subsidiary in South Korea brings Heraeus closer to the customer



Seoul is a city of superlatives. With over 25 million inhabitants, the greater metropolitan area is among the five largest urban areas in the world

and is one of the world’s leading economic regions. In June 2016, Heraeus established a new subsidiary in South Korea and opened offices in Suwon, around 48 km south of Seoul. Steve Jang, President of Heraeus Korea, explains the advantages of the new subsidiary: “As a home to large conglomerates and important sectors such as the automotive supply and electronics industries, South Korea has long been an important market for Heraeus. Thanks to the new structure, we can conduct business more efficiently and provide our customers with better service.”

Heraeus Korea is not only an advanced base of Heraeus Electronics. The new subsidiary in Suwon is also consolidating the sales and marketing activities for various other business units. Furthermore, the customers of both Heraeus Emerging Business and Heraeus Noblelight benefit from an application laboratory.

Closer proximity to customers, shorter response times, and a strong market presence should also help Heraeus gain additional market share. “The customers are more aware of our entire portfolio now,” Steve Jang is pleased to note. However, the head of the new subsidiary wants to establish more than a name. Steve Jang has set grand objectives for South Korea, and this founder’s spirit extends to the design of the new offices in Gwanggyo Business Center, which exude a bit of a start-up atmosphere. The rooms are open plan and there are almost no assigned workspaces: For Jang, this provides the best framework for finding creative solutions that benefit the customer.



Proximity to our customers around the world

Commercial Excellence is an important component of the overall concept of Heraeus Excellence, which drives forward processes and procedures that improve marketing and sales activities. Heraeus has been promoting this since 2016, presenting Heraeus Excellence Awards in the “Best Commercial Initiative” and “Best Sales Strategy Execution” categories. “We want to emphasize the important role our sales and marketing community plays at Heraeus,” explains Dr. André Kobelt, Chief Commercial Officer and a member of the Heraeus Holding Board of Management.

At Heraeus, the concept of Commercial Excellence is applied worldwide. A global network of strategically important locations enables Heraeus to be as close as possible to its customers as well as its markets. This is the only way to offer the customers the best possible solutions. Our employees work together with our customers daily on-site and really listen to them. This helps us understand their problems and requirements so well. For example: Heraeus Photovoltaics must fulfill specific requirements in the fast-paced solar industry to maintain a leading position in this changing market. Having a global network allows Heraeus to react to market trends and optimize its products in the shortest possible time while meeting current customer demands.

Heraeus is not only a supplier of materials but also a sought-after development partner, and we are directly involved in the customers’ projects. Heraeus Electronics is also involved in the development process of a major Japanese semiconductor manufacturer and significant player in the power electronics market. Building on relations with strategically important customers is invaluable for breaking into the Japanese market. By providing development services, Heraeus takes on responsibility, successfully building up a sense of trust, a cornerstone of successful business relationships, and not just for Japanese customers.

America

 2,088

 527.4



»The heart of our success as a business is giving customers an unmatched level of service and support. Since Heraeus sensors are used in so many different industries and applications, our team has to be knowledgeable in every one of those businesses, and I believe that's what sets us apart from our competitors. As a simple example: we always answer our phones; it never goes to voicemail during working hours. And we respond immediately to customer emails, even if we do not have the final answer.

HST is not about sales transactions; to us, it's all about trust. Our employees have decades of experience and expertise, and it is important that they are available and accessible to share their knowledge and support our customers. We do not view customer service or technical support as a business cost, it's an investment in our customer relationships.«

Viren Pathare

Vice President and General Manager,
Heraeus Sensor Technology Americas

Germany

 4,703

 227.6



»The profound application knowledge at Heraeus is the key to helping our customers with problem solving. As a former employee of a strategically important customer, I am very familiar with our customers' needs and market demands. Exchanging experiences in an

open and reciprocal manner paves the way for trusting cooperation that benefits both companies. Heraeus is directly involved in the customer's development projects, which gives us a sustainable relationship with the customer and provides inspiration for our own product innovations. «

Peter Dietrich
Product Manager Material Systems,
Heraeus Electronics

Europe (excluding Germany)

 1,560

 344.8



»We do not take customers for granted. There is plenty of competition and options. Every time we meet with a prospective or existing customer, our goal is the same: to identify the needs in their businesses where a

Heraeus Noblelight product or system can add meaningful value to their operation. Everything we do and everything we produce is focused on how it can generate benefits for their processes.

While we are a technology company, our business ultimately comes down to the personal relationships we have with customers. That means truly listening to their needs and looking for ways where we can apply our expertise and technical innovation to helping them solve those challenges. To me, that's how we earn their trust and earn their business. «

Ian Bartley
UK Business Manager,
Heraeus Noblelight

Africa/Australia

 134

 47.1



»Commercial Excellence means to me to be successful, no matter the circumstances. It means to meet exceptional levels of service by being sustainable in planning, commitment and passion in

all situations. In order to achieve a high level of customer satisfaction, you need good business ethics and a strong and motivated workforce on all levels. Moreover, it is about surpassing expected company work standards and reflecting professionalism in character, approach and resolve. This is what distinguishes Heraeus as a preferred supplier. «

Kirsti Kuhn
Sales Account Manager,
Heraeus South Africa

Asia

 3,884

 857.9



»Our photovoltaics customers need to be agile and innovative because the market changes so quickly. That is why we hyper-focus on customer relationships. We engage our entire local team, from R&D to production to support staff, to work with customers, understand their needs and requirements and deliver quality and innovation quickly.

Commercial excellence has so many different dimensions, but we all embrace the fundamental guiding principles: listen to their needs, and anticipate their future needs; be responsive and work with a sense of urgency; and deliver what we promise, every time. That's the way to measure success: when you make a customer's business successful. «

Dan Zhang
Global Sales Head,
Heraeus Photovoltaics

HERAEUS IN 2016

> 6,000

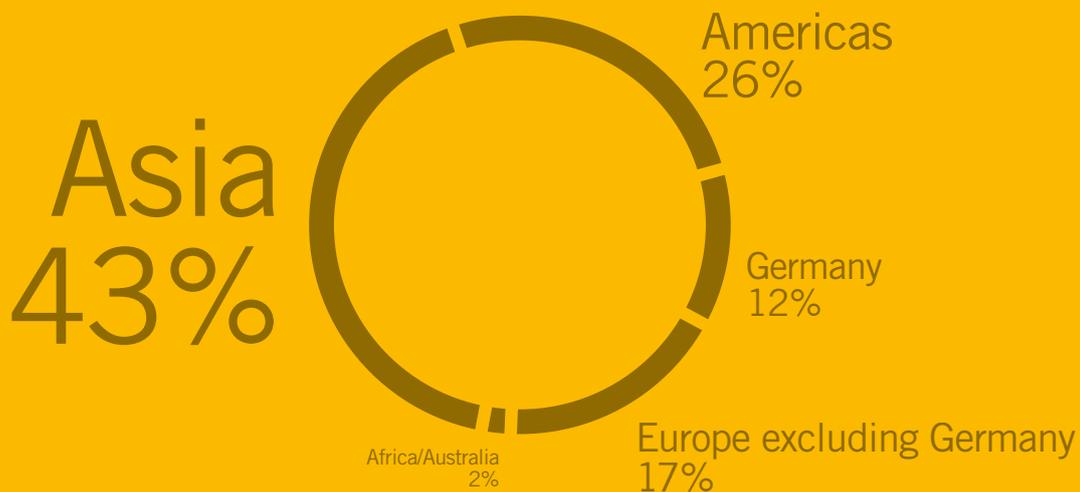
Patents and patents applications

12,369

employees

€2,005 million revenue
excluding
precious metals

Revenue excluding precious
metals by region



HERAEUS

OUR AREAS OF EXPERTISE

In the fiscal year 2016,
Heraeus Holding comprised the
following areas of expertise

HEALTH

Heraeus carries on the Group's long tradition in this area as it continues to be one of the world's most in-demand suppliers of medical technology and medical components.

Revenue excluding precious metals in million €

2016	2015
399.7	356.7



ELECTRONICS

This area supplies to consumer electronics customers worldwide and offers outstanding solutions for the automotive, information-technology, and telecommunications sectors.

Revenue excluding precious metals in million €

2016	2015
630.4	592.1



INDUSTRIAL APPLICATIONS

With this area and its expertise in dealing with high-temperature processes and the industrial processing of precious metals, Heraeus has long been a sought-after and reliable partner for industry.

Revenue excluding precious metals in million €

2016	2015
564.8	579.0



ENVIRONMENT

Heraeus products from this area make a significant contribution to efficient energy production. This area also impresses with its power of innovation.

Revenue excluding precious metals in million €

2016	2015
309.4	285.6



CORPORATE

This area of activity focuses on the Group's ground-breaking and future-oriented activities. The Group has bundled its ground-breaking and forward-looking activities in its Corporate area. This area is also home to Heraeus' Corporate Functions that perform inter-divisional functions for the Group's operating companies.

Revenue excluding precious metals in million €

2016	2015
100.5	115.7





Courage brings opportunities

Eugen Mate has taken on many responsibilities at Heraeus in Romania. He is convinced that courage is contagious. And courage is a great motivator.

When Eugen Mate joined Heraeus four years ago, he was beginning a new chapter in his career. His first responsibility was transferring a production location from France to Romania and establishing a new production facility. As the team leader for production, he learned a great deal during the transfer and oversaw the start-up of production. “There were just a handful of people on the team and we were compiling the documentation, processes, and volumes for our customers,” explains Mate. “Although the French colleagues were very cooperative, that was a major challenge for us, and the results weren’t always clear. But together as a team we concentrated on the possibilities of success, not failure.”

After that, Mate worked simultaneously as a process engineer and team leader. A year and a half later, Heraeus Romania (HROM) opened a competence center for solder powder. Mate was tasked with introducing new technologies for production and developing new methods at an affordable cost. He was also involved when the Romanians helped their Chinese colleagues from Heraeus (Zhaoyuan) Precious Metal Materials to build two new production lines and move to a new location. “With new challenges, you always feel a bit like you’re on your own,” says Mate, speaking

from experience. Fortunately, he is able to discuss any major challenges with his supervisor, who has been very helpful, and his team goes above and beyond their job description to give him support. “We make decisions together and share our opinions like a family,” he smiles.

Tackling the difficult tasks first

When HROM implemented the HPS system – specifically globally uniform production standards – Mate was involved in the standardization of 5S and the alignment of the entire department. After achieving positive audit results, Heraeus offered him the position of Lean Manager. “Accepting this position meant changing the mindset of my colleagues, giving them direction, and developing new ideas that would impact all of our employees,” states Mate. He is the kind of person who gladly shares his knowledge and experience with others, so he accepted the job.

“Throughout all these years I have followed an important principle,” explains Mate: “Share your courage with others.” He firmly believes this is the way to overcome obstacles and inspire people who need motivation. His advice: “Start your day with whatever task seems most challenging and complicated, and your other responsibilities will seem effortless by comparison.”

»Together as one team
we concentrated on the
possibilities of success,
not failure.«

Eugen Mate
*Heraeus Romania, Timișoara,
Lean Manager*





Training for change

Heraeus continues to develop its global production landscape. This includes not only extensive investments in new technologies and locations, but also in training employees. The Excellent Leadership in Production program provides one example, as managers gain the right tools for tomorrow.



Christopher Dürhold
Shift leader HPM Schmelze,
Hanau

When it comes to melting precious metals, the vessel used is essential. A crucible, as these containers are called, can often only be used once. At the same time, different alloys each require their own crucibles. “Since we process so many different products, we needed a lot of storage space,” explains Christopher Dürhold. As shift leader, he is one of the people responsible for materials procurement, equipment, and resources for the smelter at HMM in Hanau. The problem is that storage space costs money, and the crucibles tie up a great deal of capital in the warehouse.

As part of the Excellent Leadership in Production program, Dürhold developed a new approach for supplying crucibles, together with his team and colleagues from other GBUs: In the future, the entire process will be mapped in SAP. Logistics will automatically restock when inventories get low, which will help to reduce the overall inventory and make it no longer necessary to keep extensive stocks on hand. This will save around 60,000 euros annually.

Continuing to develop the leadership culture

Dürhold is one of the nearly 120 managers to have already completed the program since the start of the year. The program is aimed at the first two levels of managers on the shop floor. The Excellent Leadership in Production program emphasizes that participants actually take their newfound knowledge and apply it to their daily work. “The theoretical phase is followed with two practical phases, in which participants implement their own optimization projects, supervised by a trainer,” explains Georg Remmers, Head of People and Organizational Development and HR Marketing.

The program also makes the Leadership Model easier to grasp, as Heraeus has defined what a leadership culture that supports the long-term growth targets looks like. All four pillars of the model are involved: Additional Lean knowledge, for example, supports skills in the “leading the organization” area. In the practical phases, special emphasis is placed on reflecting on the role of leadership, and thus also improvement in the “leading myself” area. The program’s topics can also be tailored precisely to

Theory and application coming together: As part of the training program, Christoph Dürhold worked together with colleagues to develop a new approach for supplying crucibles used in melting precious metals.



»The only way we can comprehensively modernize our production is if we equip our management team with the necessary knowledge.«

[Michael Werth](#), Group Excellence Officer

participants’ needs. “I was able to apply a lot of what I learned in my project directly to my work, and I also built a good network across the company, since managers from various GBUs took part,” says Dürhold. In addition, the project’s benefits have more than made up for the cost of his training. Heraeus is investing 18 days of training for each of the participants, with a clear goal in mind. As Group Excellence Officer Michael Werth puts it: “The only way we can comprehensively modernize our production is if we equip our management team with the necessary knowledge.”

The program is linked closely with the modernizing operations with the Operations Excellence program (see page 3), which launched in 2015. “The managers are specifically trained in connection to a module,” says Werth. Around 300 employees will complete the program in just the Rhine-Main region by 2018. The international rollout of the program began at the start of 2017.



Smart planning, big impact

The introduction of a group-wide SAP system is a major achievement, and not only for IT. It means the revision of all the business processes in each Business Unit. At Heraeus Medical, there were also special challenges – and particularly effective project management.

Big IT projects don't run on their own. Nicole Peterman of Heraeus Medical explains why successful project management and leadership are intertwined. She says: "Clear communications, close cooperation, and the great dedication of everyone involved were the most important factors for the success of this project. Good planning, precise control and careful follow-up are secondary."

But the planning came first. In that regard, Nicole Petermann benefited from the fact that as Head of Finance, Commercial Services & Operations at Heraeus Medical, she is very familiar not only with her own departments, but also with the Heraeus Group. She joined the company in 1995 to complete her dual studies program, then worked in a variety of other positions before finally coming to the Heraeus Medical Global Business Unit (GBU) in 2008.

As the project manager when the SAP platform was introduced in her department, Petermann quickly identified the unique characteristics of her GBU as part of the overall process: "We had to take into account the special require-

ments of the regulated environment we work in, while also supporting our own sales activities." This is especially important here, as Heraeus Medical markets its products in many countries directly. Each day, hundreds of shipments leave the production sites in Wehrheim and are transported via external warehouses and logistics service providers to reach hospitals and pharmacies all over the world.

For the project known within Heraeus as Magellan, reflecting its global nature, this meant additional requirements placed on the software, corresponding to the legal requirements in the healthcare market. It also meant mapping a host of interfaces to logistics service providers all over the world. Or, to put it another way: Petermann and her team had two major additional hurdles to overcome.

The formula for success: Transparency

It should come as no surprise: They rose to the challenge, and more. The introduction of the SAP platform at Heraeus Medical set the standard Group-wide for the future connection of additional operational units. What was the key to their success? Petermann thinks for a moment, then quickly sketches a clear picture of the complex project: "We laid the cornerstone for our success right in the kickoff event. From the beginning, we had open communications with everyone involved, and talked about the changes to come, the necessary process adjustments and potential stumbling blocks."

The overall process also benefited, Petermann says, from the fact that her team is open to changes: "We see change not as a threat, but as a challenge, almost a game," she explains. After all, Heraeus Medical is growing rapidly. Organizational adjustments are almost a matter of routine, and the constantly changing regulations in the healthcare

market require a certain degree of flexibility as well. “We’re accustomed to adapting our structures to meet new demands. But we also know this: We implement any changes only in ways that are appropriate for our business.”

To ensure exactly that, Heraeus Medical defined its requirements for the new software early on, and potential effects on its business were carefully analyzed: How will our processes change as a result of the SAP standardization and business process harmonization in the new software? What are the implications of these changes, and where could they become critical for our business? “We defined more than 130 of what we called ‘change impacts,’ that is, factors that have major effects on our processes as a result of the introduction of the platform. Then we systematically tackled these challenges,” Petermann explains. This entailed numerous training sessions, informational events, and workshops establishing new processes, revising operating procedures, and drawing up extensive documentation that forms the basis for validation of the software. In some cases, the software template had to be finally adapted to meet the specific needs of Heraeus Medical, after which the comprehensive test phase began. “Ultimately, we had made a firm commitment: We would not launch the system until it was working perfectly.”

And it did. “Our customers hardly even noticed the rollout – and that’s the way it should be,” Petermann says. And is there anything that she would do differently today? “There’s always room for improvement, and that goes for this project too,” Petermann replies. However, she still has to stop and think before she replies. “We gave out plenty of information at the start and throughout the course of the project. Still, in the next project I would pay even more attention to a carefully considered and ongoing process of communication. Because well-informed and dedicated employees are the key to success.”

Magellan

A common and largely standardized SAP Enterprise Resource Planning System (ERP) will help to improve and harmonize business processes in every area of the Heraeus Group – this is the purpose of Project Magellan. The ambitious goal: To manage the organization better, boost efficiency, strengthen competitiveness and accelerate growth. The project has already been rolled out in 6 out of 9 Global Business Units.

»Close cooperation with everyone involved was the most important factor for the success of this project.«



Nicole Petermann
Head of Finance, Commercial
Services & Operations,
Heraeus Medical



Advancing development of the innovation culture @ Heraeus



As of January 1, 2017, the three startups (Fuel Cells, Additive Manufacturing, Battery technology) were removed from the structure of the Heraeus New Businesses Global Business Unit. Dr. André Kobelt, Chief Commercial & Technology Officer, explains why the change was made.

Dr. Kobelt, the Heraeus startups are no longer part of an operative unit. Instead, as “incubator platforms,” they now report directly to the Holding Board of Management. How did this step come about?

ANDRE KOBELT: Startups are young entities with great ideas and enthusiastic employees but they have yet to identify their successful business model. This search proceeds dynamically. Our operational units, the Global Business Units (GBUs), have already found their model. This basic difference calls for different treatment, whether it has to do with supervision, planning, releases or other details.

Therefore, after about 20 months we have taken the startups that have been successfully launched and moved them out of the Heraeus New Businesses GBU, with the clear goal of giving them more focus. As a result, all startups now report directly to the Holding Board of Management. Every three months, we hold a meeting to review their finances, business practices and scientific status and to discuss their future prospects.

So the management of their business takes place at short intervals, very efficiently. We hope that we are building new, attractive businesses with the startups. But we must also clearly acknowledge that not all startups will succeed. Accepting failures is also a part of this culture.

Do you hope that our startups will create synergies for our established GBUs?

ANDRE KOBELT: By their very nature, startups are like lions in the wild, trying to make the most of their scant resources. They do this by networking, working with external partners. Their agile way of working can be an inspiration to our established businesses. At the same time, the startups can also learn from the GBUs' experiences – in short, the interaction is very beneficial.

Do you intend to establish new startups, and should these be managed as independent entities outside the GBUs?

ANDRE KOBELT: When we want to establish a new startup, we examine the idea and explore its technical feasibility, the patent situation, and whether there is an attractive market. If our analysis comes up positive, we consider establishing a startup. Such a startup can be managed either as an independent entity or within a GBU. The decision is made on an individual basis. We currently also have startup structures within the GBUs, whether it's the Materials Solutions at Heraeus Electronics, the topic of LEDs at Heraeus Noblelight, or, especially, regenerative medicine at Heraeus Medical. I think it's terrific that some dedicated employees have sought me out in recent months and asked for the green light to establish such a startup. I hope that this interest is long-lasting.

»We want to grow sustainably.«

Dr. André Kobelt
Member of the Board of Management,
Heraeus Holding



How long are the innovation cycles within the GBUs?

ANDRE KOBELT: Starting in July 2017, for all the GBUs we will also look quarterly at the entire product life cycle, from the initial idea to marketing. The process includes the head of the GBU, the heads of Innovation and Marketing, and the Holding Board of Management. It is important to close the gap between Research and Development and Marketing and Sales.

What sort of expectations do you have for the new Innovation Center?

ANDRE KOBELT: Basically, it was conceived as more of a communications center. Our goal is to intentionally promote interaction among the various developers and across their skillsets. This will also strengthen our innovative capacity. Employees from different GBUs work in five areas of expertise. Innovation doesn't happen in just one place, and it's more than just the physical product innovation. We intend to use the new building to break up isolated islands of knowledge, by bringing a critical mass of knowledge holders together in one location to share their experience. This is by no means the central research and development

department for the Heraeus Group; the projects are selected, developed and financed by the respective GBUs.

The whole thing is supported by a new approach to space and work that makes greater use of digital resources for collaborative efforts. We purposely intend not to have individual offices, but modern, open spaces for collaboration.

Communication with the employees in the respective GBUs is important. The most significant development projects must be known across the organization, and there must be a steady flow of information about their progress and anticipated launch dates. We spend approximately 150 million euros on research and development and we must have transparent reporting about its use.

At the same time, it is also important to communicate our lighthouse projects to the outside world, though only those for which we already have something to report. This communication helps us in positioning the company, recruiting new employees, preparing for product launches, and ultimately in motivating ourselves. We can be proud of the great projects we are working on at Heraeus.



Turning ideas into healthcare innovations

At Heraeus medical components we are convinced that the ideas of our employees make a very valuable contribution, because innovation in the health care sector is vital. Our staff continuously analyzes customer needs and industry trends to discover new technologies and solutions to improve treatment and patient care.

In healthcare, device manufacturers and pharmaceutical companies place enormous resources and attention on their product “pipeline.” It is clear why these pipelines are such a coveted asset: product development is a long, challenging and highly-regulated process. A robust pipeline is vital to bring promising life-changing technologies to market.

As a leader in the development of high-value Functional Components and Finished Devices solutions for the Medical Device industry, Heraeus Medical Components (HMC) has created an innovation culture with a vital purpose: to cultivate a “pipeline” of new ideas throughout every department of the organization. HMC President Nicolas Guggenheim believes this approach is the best way to ensure the company’s competitiveness and success. Guggenheim says, “innovation happens when each individual thinks about new ways to work, to solve issues, to improve things.” By being open-minded, approaching things creatively and thinking critically, he adds, “that next idea could make a difference in helping our customers improve outcomes and patient care.”

The HMC idea pipeline goes beyond traditional product focus, emphasizing a holistic approach. In 2014, the organization launched an HMC Innovation Award Program to encourage and engage employees at all functions to bring fresh thinking and imagination to their work. Across the

globe, employees bring forward their best new ideas in four primary categories: Best Product Innovation, Best Innovation Cooperation, Best Manufacturing Process and Best Business Process & Lean Initiative. Since its inception the Innovation program has collected over 180 projects from employees in the Americas, Europe and Asia. Submissions range from ways to improve office procedures to supply chain operations to complex engineering initiatives and new product development.

Every idea counts

To Guggenheim, the program strengthens the organization’s patient-first mission. As for the criterion for evaluating projects and ideas, the management team has a surprisingly agnostic perspective. “Every idea that comes forward, whether it is large or small, positively contributes to our mission to improve the lives of patients. It does not matter whether that innovation impacts an office, an R&D lab, an engineering initiative or our manufacturing and operations, they all add up.”

This focus also enables HMC to create an achievement-oriented culture and high-performing workforce. According to Roycie Eppler, Senior Vice President of Human Resources, the program has galvanized employees across every function to challenge the status quo and seek new ways to do things better. To Eppler, one of the program’s

biggest successes is that “it has allowed us to re-define the meaning of innovation. It’s not just the exclusive domain of our R&D scientists and engineers. The program re-enforces the message that every employee is empowered and encouraged to bring forward innovative solutions and ideas.”

One example of the impact of Heraeus Medical Components innovation can be seen in the critical area of guidewires, which are ultra-thin metal wires (with a thickness of about 0.014 inches) that help guide catheters through a delicate network of blood vessels to safely reach treatment zones. In critical cardiac treatments such as an angioplasty, surgeons need to safely navigate medical devices from a needle entry in the leg through the blood vessel and into the heart at the exact obstruction in the artery.

Dave Liebl, Executive Vice President of Finished Devices said, “Blood vessels have many branches similar to a tree. As the surgeon steers the guidewire through this complex network of twists, turns and blocked arteries, the guidewire often kinks and requires the process to be repeated. We want to reduce and eliminate this risk.”

One of the HMC project teams helping to address this challenge is led by Jason Albers, the Director of Product Development for Procedural Devices. Along with Project Engineer Dustin Andrist and R&D Technician No Thao, Brian Dukart and Ciaran Hood, Albers and his team worked on developing a guidewire with a new alloy with a balanced stiffness that could be easily pushed through the blood vessels without kinking. Albers said, “Once a stainless steel guidewire kinks, it’s difficult to remove and the clinician has to remove the bent guidewire and all the devices and components to start over. We needed to create an alloy that would enable the guidewire to perform better under this demanding environment.”

Progress through new material combinations

Albers and his team capitalized on Heraeus’ expertise in materials science to develop a new alloy derived from nickel, cobalt and titanium. Using a specialized and proprietary material processing technology, the new guidewire essentially removes complications due to kinking since the shape memory alloy is more kink-resistant and improves the safety of the procedure. Albers adds, “My team and I are personally gratified that our work will have positive benefits to patients and clinicians alike.”

Innovations like this are rewarding to Nicolas Guggenheim because every idea, every project and every initiative enables the organization to deliver greater value to medical device customers, healthcare providers and, most importantly, patients. “To all of us, the ultimate well-being of patients is a sacred responsibility. A single, simple idea can make all the difference.”



Two questions for...

Heiko Specht,
Senior Vice President Innovation,
Heraeus Medical Components

Innovation is often focused of R&D, scientific and engineering functions. How did you make HMC’s approach more holistic?

Innovation is not the sole responsibility of the HMC Innovation group. We encourage every employee, at every site, at each level and at each function to contribute new ideas and solutions.

If everyone at HMC is asked to contribute to the innovation process, what is the responsibility of the HMC innovation group?

We continue to add new technologies to our portfolio, offering our customers a broader range of products and solutions. We also practice Open Innovation. Innovation together with customers and external partners is critical to us. Therefore the HMC Innovation group has a dedicated scouting team which is continuously exploring new needs, trends, technologies and opportunities. To ensure customer focus and drive commercial success we also create startup ventures based on innovations and technical developments.



And the award goes to . . .

40 finalists in 18 teams eagerly awaited the results at the 2016 Heraeus Awards ceremony

Kink-free guidewires for catheters, new and successful marketing strategies for better customer retention, cost reductions in production or optimizations in production processes – they all have one thing in common: They are among the winners in the 2016 Heraeus Awards. Each year, Heraeus recognizes its brightest minds and most talented employees with awards in various categories, honoring the best teams across the company.

For the 2016 awards ceremony, the jury could choose from a wide variety of new technologies, cooperative projects, marketing ideas, and excellent improvements in production. In addition to the established awards for Innovation (Research & Development) and Operations (Production & Supply Chain), a new category was introduced this year: Commercialization (Marketing & Sales). Two prizes are awarded in each category. The prize-winning projects demonstrate the skills of Heraeus employees all over the world.

Highlighting excellent projects and the teams behind them

A total of 40 employees in 18 teams made it to the final round. The winners were recognized and celebrated at a large event in a central location at the end of November. “We realigned the awards in order to recognize the extraordinary commitment of our employees, who take real pleasure in competing with each other. Our sustained success depends on their innovative ideas in research and development, production and marketing,” remarked Jan Rinnert, CEO of Heraeus Holding, as he lauded the finalists at the awards ceremony.

Excellent innovations, production processes and marketing and sales initiatives are crucial to the sustained long-term success of a technology company such as Heraeus. A total of 74 applications were received for the six awards. “This high number demonstrates that our employees are performing exceptional work in many areas,” emphasized André Kobelt, Chief Commercial & Technology Officer and the mentor for the Heraeus Awards. “We want to showcase the great projects and the strong teams behind them and to honor their achievements.” The centralized event with participants from all over the world provides the right setting.

The Innovation Award symbolizes the breakthroughs that Heraeus developers accomplish with their innovations.



CATEGORY: INNOVATION


BEST INNOVATION
New market entry with novel patented guidewire

Team: Jason Albers, Dustin Andrist, Brian Dukert, Nou Thao and Ciaran Hood (Heraeus Medical Components)

The kink-free **bendable guidewire** for catheters is a completely new medical product on the market for minimally invasive surgery. The spring shaft guidewire offers a significant improvement in clinical functionality. Guidewires are movable tracks for transporting therapeutic products within catheters to their desired position in the body.


BEST COOPERATION
Die Top System: A triple win for Heraeus, Danfoss and the market

Team: Andreas Klein, Anton Z. Miric, Andreas Hinrich, Peter Dietrich, Michael Schäfer (Heraeus Electronics)

The new Heraeus **Die Top System** offers new assembly and joining technology for silicon and silicon carbide power semiconductors. The innovative system is used in power electronics modules for renewable energy, in electromobility and in other demanding industrial applications.

CATEGORY: OPERATIONS


BEST LEAN INITIATIVE
An innovative lean approach to reduce variations

Team: Karim El Harif, Javier Perez, Helene David, Sasa Markovitch (Heraeus Medical Components)

PaceMaker is a production model for the production site in Yverdon (Switzerland), which reduces the impact of unexpected orders. At the same time it brought significant production flexibility and quality improvements for Heraeus Medical Components. A very challenging process was transformed into a simpler system.


BEST HPS ACHIEVEMENT
Buford best HPS achievement

Team: Tim Jenkins, Emily Bailey, Chris Urry, Peter Craymer, Levon Fattal (Heraeus Quarzglas)

Production employees in Buford introduced the Heraeus Production System (HPS) at their site with great success. Implementing the necessary cultural transformation presented a major challenge, and the project succeeded as a result of continuous, dialogue-oriented communication and the team's strong commitment to the program.

CATEGORY: COMMERCIALIZATION


BEST COMMERCIAL INITIATIVE
QUIK-SPEC: Direct analysis in converter

Team: Gilles Déléry, Joël Gammaitoni, Marc Vergauwens, Jan Cuypers, Luc Lammerant (Heraeus Electro-Nite)

QUIK-SPEC is a sensor measuring system for the steel industry that makes it possible to conduct chemical analyses directly during smelting and faster than ever before. This completely new approach allows us to conform to the customer's process more closely.


BEST SALES STRATEGY EXECUTION
Challenger sales approach

Team: Samantha Buitendag, Lothar Kiontke, Meike Zimni (Heraeus Medical)

Challenger is a marketing strategy that focuses on what the customer wants, with the goal of strengthening customer retention and thereby creating sustained growth. After the successful introduction of this approach, many new customers were gained.

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