

HENRY
INSIGHT



25 years

Your first choice in precious metal recycling

On the way to climate neutrality
Sustainability advisor Sascha Ziese in the interview

Platinum
Key element for the energy transformation

EDITORIAL

Dear reader,

An anniversary is always a good reason to celebrate! We think that 25 years is definitely an occasion to look back at what we have achieved and to celebrate together. The fact that we have actually managed to come so far is due to hard work, entrepreneurial spirit and skill, but above all, the commitment of our employees and the loyalty of our customers and business partners. We are rather proud of our company and that we can fulfill our mission to make the world more sustainable and responsible.

A look back over the years shows us that not only our company, but how all the markets and technologies have changed. There are new materials entering the market, while others are disappearing. There are also new recycling processes and others which still need to be developed.

We are therefore looking to the future with confidence. We know that we are operating in a constantly chang-

ing world and therefore we both must and want to develop so that we can also be successful over the next 25 years. We are always looking for new business areas that enable us to strengthen our position as a leading innovator in the sector and to be your dependable, sincere contact partner for everything related to the topic of precious metal recycling. Therefore, there is much to be done and we are pleased to do so because precious metals are our passion.

We are grateful for your support and excellent collaboration as we look forward to further joint success. Keep in touch with us and do not hesitate to contact us at any time. An open dialogue is important to us.

With kind regards



Clemens Hensel



Thomas L. Hensel



Oliver Krestin



IN THE FOCUS: 25 YEARS HENSEL RECYCLING



THE TOPICS

Company anniversary

For 25 years your first choice in precious metal recycling	4
Employer with long-term view	7
Small? Medium? Large? How the business of buying catalytic converters has changed in the last 25 years	10

Analytics

IDO-Lab: Expansion to full service laboratory – interview with the head of the laboratory, Thilo Lindemann.....	13
Useful information about platinum and why the energy transformation cannot occur without this precious metal	16
Platinum salt, platinum ink, ionomer – News from BEST4Hy	18

Sustainability

On the way to climate neutrality – interview with the sustainability advisor Sascha Ziese	19
Sustainability report: mandatory or secondary? Five questions for Prof. Dr Carsten Reuter	22

News

Back to school	24
Girls' Day	25
Women in Manufacturing	26
Health and sports	27

Imprint	28
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FOR 25 YEARS ...

your first choice in precious metal recycling

This summer is the anniversary of Hensel Recycling. Throughout 25 years in the market, there was always something new showing up. If you compare our business operations from the past with today, you can see how the recycling market has developed: technologies, the range of materials, and how the statutory framework have changed significantly and are now still subject to continuous, rapid change.

Anniversary in times of crisis

Despite the difficult market conditions and the restructuring during and after the pandemic, large amounts of electronic scrap as well as catalytic converters were processed while prices were still at good levels. Then came the war between Russia and Ukraine: inflation, increasing energy prices and, above all, volatile metal prices that are affecting the business.

Prepared for the future

Hensel Recycling is looking forward and anticipating long-term market changes. What has happened in the individual target sectors is of course directly affecting the business. For this reason, the team is monitoring whether manufacturers are buying more or less material, changing to different materials, or placing new types and models on the market, then if so, to what extent, precious metals are substituted.

"We can look back at the last 25 years with a certain degree of pride and great satisfaction. We are operating in volatile markets and current economic upheavals do not always make it easy for a specialist in precious metal recycling. However, with our willingness to further develop, we are well-established as a dependable partner."

Clemens Hensel



Diversity of materials: along with various catalytic converters, among other items, printed circuit boards and oxygen sensors are recycled.





Catalytic converters are still sorted, processed and recycled in large numbers. However, the catalytic converter system is a decreasing system.

Composite materials and minute particle size often make it more expensive and complex to separate the components containing precious metals from the rest. The changing service life cycle of vehicles and mobile phones are also playing a role. All of these aspects will affect recycling businesses sooner or later.

Slow farewell to our initial market

The era of automotive catalytic converters is coming to an end: electric cars do not produce any harmful emissions and accordingly do not need exhaust after-treatment systems. The existing global fleet has sufficient material for several decades, but what will happen after that? “We do not want to wait, instead we are successful and active in many markets: electronic scrap, industrial catalytic converters and others,” explains Oliver Krestin.

Fuel cells and solar panels

The business is investigating potential new sources of materials, in particular fuel cells. Here, we are still at the exploratory stage: a handful of fuel cells are processed each month. The recycling of photovoltaic panels could become an interesting business in the future. The first major wave of solar modules installed will soon reach the end of their service life and then the issue will be to detect these waste streams and exploit them.

Focus on sustainability

At Hensel Recycling, sustainability is not wishful thinking or a reaction to general social pressure, but has always been part of our corporate philosophy. Sustained growth goes hand in hand with social commit-

“We are setting up a team so that in 15 to 20 years, when the volumes are there, we can impress with corresponding specialist competence as a recycling partner for fuel cells.”

Oliver Krestin



“I am confident, though, we can withstand a little turbulence. We’re well positioned to stay on top of our game.”

Thomas L. Hensel



ment and improvements to reduce our ecological footprint. Sustainability is viewed and approached holistically.

A clear goal has been formulated to back up these noble words with deeds: climate-neutral by 2030. For this purpose there is a roadmap and a comprehensive action plan. You can see more about what this plan involves in the interview with our sustainability officer Sascha Ziese on page 19.

Conclusion

Although Hensel Recycling is looking at new projects, the issue is to further develop the business technologically, and at the same time, to retain the loyal workforce. This workforce enriches the business with a wealth of knowledge and experience while also shaping the family-like corporate culture.

FACTS AND FIGURES

Founded:	1998
Headquarters:	Aschaffenburg, Germany
Employees:	About 160 in Germany and 220 worldwide
Sites:	Australia, Austria, France, Great Britain, Malaysia, South Korea, USA

MILESTONES

2023:	Hensel Recycling celebrates its 25th anniversary
2021:	The BEST4Hy R&D project is the start of an international partnership to develop techniques to recover critical raw materials from hydrogen technology
2017:	A processing plant for electronic scrap is put into operation
2016:	Company name change from Duesmann & Hensel Recycling to Hensel Recycling
2014:	Thomas L. Hensel joins the business as a managing partner. He and his brother Clemens Hensel take over the shares as equal managing partners
2006-2014:	As part of a globalisation strategy, Hensel Recycling opens subsidiaries on all five continents
2004:	A recycling plant for metal catalytic converters is put into operation Initial certification, DIN EN ISO 9001 and 14001
2003:	Clemens Hensel and Ralf Duesmann become managing partners and put a processing plant for ceramic catalytic converters into operation
1998:	Alexandra Duesmann starts the business as an organisation for collecting catalytic converters

EMPLOYER WITH LONG-TERM VIEW

In an anniversary year, there is a tendency to look at how the number of employees has changed since the company was founded. However, the loyalty of employees to their employer is more informative. This year, eleven employees will be honoured for 10 years of service and twelve employees for 15 years of service.

Three colleagues will even celebrate their 20th anniversary. What are the reasons for the low fluctuations in personnel at Hensel Recycling, that keeps employees at ease and loyal to the company for many years?

Petra Häger is the longest serving member of our staff and has been with the company since 1999. She and the employees celebrating 20 years of service answered three short questions:



Which special moments do you remember?

During almost 25 years much has happened and I cannot highlight one event that would do justice to the many special moments.

Perhaps the following anecdote is appropriate: I can no longer remember the year, but during a Christmas party all the employees who had joined the company that year were supposed to stand up. In the rapidly growing business in the 2000s, you can imagine: most people stood up.

From your point of view, what has changed significantly during these years, what has stayed the same?

The company has changed from a franchise business into an international business. At the beginning, we contacted customers by telephone, collected the catalytic converters and sold them on to the franchisor. The transition occurred in 2003 and rapid growth set in. We were continuously incorporating new colleagues. Our values have stayed the same: pragmatism, loyalty, and honesty. A real family business. A business that gives you the sensation that the focus is on people. Some things have also changed in the sector: If I look back to the day I joined the company, precious metal prices were \$345 per ounce of Pd, \$350 per ounce of Pt and \$928 per ounce of Rh. Over the years palladium has, on occasion, reached eight times and platinum six times that original price and rhodium more than thirty times. I have worked in precious metal trading since 2011 and, from my own experience, I can say that the volatility of precious metal prices has definitely become a challenge.

What binds you to Hensel Recycling?

I have worked for almost half my life at Hensel Recycling. My children only know this one company. So Hensel Recycling does not just belong to my life, but to the life of my family. In the freshly founded business I always had many opportunities to roll up my sleeves and get engaged. In other words: a family person like me fits into a family business. It is like two pieces of a puzzle that fall into place!

Which special moments do you remember?

I like to look back at the decision of the senior management to undertake the processing of catalytic converters ourselves. That was in 2003 and quickly proved to be trailblazing. The company outing with a horse-drawn carriage and barbecue afterwards was also a pleasant moment.

From your point of view, what has changed significantly during these years, what has stayed the same?

My job is challenging and never boring. Every day, I can be sure that something unforeseen will force a change in the route planning. This has always been the case and also makes the job appealing. However, the strongly growing sector has changed as a whole. The price always plays a major role, there is more competition for catalytic converters than ever before. We have also grown significantly, nevertheless the company is still a family business. I am impressed by how we time and again enter the market with new products and services.

What binds you to Hensel Recycling?

In short: the team spirit. It's great to see how the company behaves in relation to its employees, above all in times of crisis. You can feel how there is always a common view of the future.



Carmen Nogaj
National sales / Disposition

Which special moments do you remember?

A special event was when we sent our first container with material to the USA. It was still unclear whether we, as a new business, would become established in the precious metal business. But then as more and more material arrived and the container was full, we celebrated!

From your point of view, what has changed significantly during these years, what has stayed the same?

The entire precious metal business has become much more complex and therefore also more complicated. Time and again there are changes to the materials which cause us to react, changes at the refiners, as well as at the precious metal dealers. But what has stayed the same is that we at Hensel Recycling have remained flexible and always find a solution to everything!

What binds you to Hensel Recycling?

From the start, when we were only around 20 people, to today, Hensel Recycling has always remained a family business in which I very much appreciate the collective feeling. Both at work where we search jointly for solutions and support each other, and during the many celebrations, we have been able to hold together.



Sabine Kopsieker
Precious metal trading

Which special moments do you remember?

The founding and establishment phase was characterized by intensive, strenuous travel, nationally as well as internationally. Sometimes one week there was a trip to the USA, with travel back the following week and then packing the suitcase again to travel with jet lag in the opposite direction to Asia. After we had successfully entered the markets, the establishment of the existing subsidiaries then followed. Together with our partners. All in all 20 various years.

From your point of view, what has changed significantly during these years, what has stayed the same?

The business grew disproportionately in the middle of the 2000s. We acquired ever more material, so we needed more capacity/space for production and administration. Of course, this growth involved the establishment of new departments. Although personal contact with all of our colleagues (in the meantime 220 worldwide) was lost as a result, luckily the great team spirit has remained.

What binds you to Hensel Recycling?

After 20 years I can say that, despite the growth, we have remained a family business in which the focus is still on the employees who are not left alone with their wishes and concerns.



And what do the youngsters say?

In May 2023, trainee Cansel Pir had the opportunity to get to know the site in Great Britain and expand her language skills. The time abroad was a small reward for her excellent academic performance and her commitment in the workplace.

“I am grateful that I had this opportunity and now better understand how a subsidiary and the headquarters work together. The colleagues in Slinfold were all very approachable and gave me many insights both professionally as well as privately.”





SMALL? MEDIUM? LARGE?

How the business of buying catalytic converters has changed in the last 25 years!

The business started 25 years ago with the procurement of catalytic converters. Since then materials, customer structure, and customer support have changed dramatically. In our interview, we talk to Carmen Nogaj, who has been working for the company for 20 years, and to Stefan Popp, who has been head of the national sales department for 15 years.

Mrs. Nogaj, how did you experience the initial years here in the company?

As one of the first female employees, initially I planned the trips for Alexandra Duesmann, who founded the company in 1998. In those days, the business collected catalytic converters predominantly from dismantlers' yards and scrap dealers in Bavaria and Hesse. In addition, there were monitors, aluminium wheels and waste containing silver from photographic laboratories. For this purpose, appointments were made by telephone - as they still are today - with the collection sites. Settlement was based on the classification of the catalytic converters into three categories: "small", "medium" and "large".

Mr. Popp, how has the customer structure changed since then?

Our customers still include dismantling yards today, however, a market shake-up is in progress: due to the lack of successors, many yards have closed; the conditions for certification in this segment are also high.

Furthermore, cars often arrive at the dismantlers' yard without their catalytic converter because it is widely known that a catalytic converter has a certain value, and it is therefore removed first. As a result, we are increasingly receiving inquiries from diverse customer groups with small quantities.

Do you collect other materials apart from automotive catalytic converters?

Nogaj: Among other sectors, we operate in the area of stationary catalytic converters: there are many systems in the area of cogeneration plants where the catalytic converters are often bulky and heavy with loading often requiring several people. Here exact information about dimensions and weight is required for their inclusion in the route planning.

Popp: A further market is diesel particulate filters discarded by filter cleaning businesses when the filters are no longer viable. Then there are a few certified partners who separate the monolith from the steel scrap in their own processing plants and we therefore only collect the monolith containing precious metals. This preliminary separation makes transport noticeably easier.

At the moment, what are the biggest challenges for generating business?

Nogaj: High precious metal prices in the past and with them also high prices for waste catalytic converters. This has caused customers to expect prices to stay high always or even climb higher. Accordingly, payments at the moment are perceived to be low, even though they are significantly higher than five years ago as an example. As a result, many of our customers are hoarding their material in the hope that prices will soon increase again.

Popp: Due to the high degree of price transparency in the market, some customers are sorting their material in a more detailed manner, looking at each individual price and then distributing the material across various purchasers. This situation then means that the quantities collected per collection point are smaller. While in the past, quantities of 50-150 items were normal, currently, 20-30 items are not unusual.

Smaller quantities collected are therefore the order of the day. How does this aspect affect the route planning?

Nogaj: Of course, it is a challenge to drive to more collection points on schedule with the same number of drivers. Therefore, the investment in the in-house development of a route planning system was abso-

lutely necessary from my point of view. In the meantime we are also using smaller vehicles. And some large customers now deliver using their own vehicle fleet.

What effect does the growing portion of diesel particulate filters (DPFs) have on the business?

Popp: The substrate material in these exhaust systems consist of silicon carbide (SiC). In the smelting process this material behaves very differently from the cordierite that is standard in conventional automotive catalytic converters. If spent automotive catalytic converters and DPFs are mixed, the recovery of precious metals is made more difficult, or almost impossible from a certain concentration of silicon carbide onward. We therefore recommend all customers who request processing to separate the DPFs.

Time and again one hears about "black sheep" in the collector market. How do you protect against them?

Popp: We are very particular about the legitimisation check. As a company in the precious metal sector, we have the obligation to undertake a "know your customer check" and have adopted strict compliance guidelines such as those issued by the LPPM.

Let us take a look back again. Which innovations do you think paid off quickly?

Nogaj: After classifying catalytic converters into three categories (small, medium and large) in the early years, we were the first business that was able to depict the plethora of catalytic converters in a printed "CATalogue". In the first issue of the so-called CATalogue, many different catalytic converters were already documented with detailed images. In the CATalogue, the catalytic converter models were classified into several categories based on clothing sizes XXL, XL, L, M, S and XS.

Popp: With the change to our app a few years ago (available for download from the Apple Store and Google Play Store) we successfully transitioned to the digital age. As a consequence, we can make new models or analysis available to our customers more quickly. Today, along with several thousand automotive catalytic converters and diesel particulate filters, large numbers of truck catalytic converters are in-

cluded. The development of a small quantity sampling system was also a good decision. With this system, settlement based on an XRF analysis is cost-effective even for quantities of around 100 items.

Looking to the future: on what innovations are you currently working?

Popp: We want to broaden our position in regard to new materials. For fuel cells we are already pretty well-positioned due to the co-operation project BEST4Hy, however spark plugs could also play a role for us in future. Of course, further digitalisation and the opportunities it offers are also always a topic. Our app makes it possible, for example, to secure prices via the favourite list. This is a powerful argument for our customers in times of falling prices.

After 15 and 20 years respectively at Hensel Recycling: what motivates you?

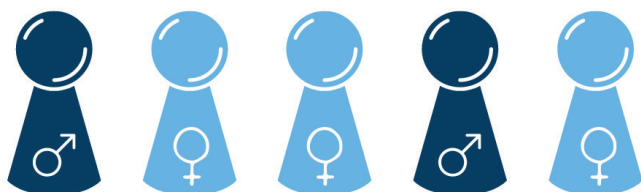
Popp: There are always varying challenges and it is never boring. What I like personally is that even in times of crisis, an effort is made to retain staff. When I started here in 2008, precious metal prices dropped like a stone unexpectedly. Nevertheless, during this time, I never had the impression that there was no future here.

Nogaj: It was also not easy during Corona: hardly any deliveries arrived in Aschaffenburg, particularly from abroad. With our great team spirit, we also mastered this situation.

Popp: What we also appreciate: we have known many of our customers for more than 10 years. During this time we have experienced much together, which bonds us together. We have a friendly relationship with many customers that goes way beyond just business.

Many thanks for the interesting background information!

Number of staff in national sales



Office staff



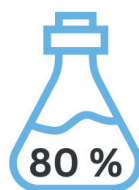
Staff on the road

Availability over 25 years



6.500 days
52.000 hours
3.120.000 seconds

Orders



Settlement
by analysis



Purchasing
business



IDO-LAB: EXPANSION TO FULL SERVICE LABORATORY

Interview with the head of IDO-Lab, Thilo Lindemann

Thilo Lindemann has been head of the IDO-Lab since 10/2022. The laboratory is considered to be an essential building block in the Hensel Recycling world and is the first choice for precise analyses of materials containing precious metals. Under the leadership of Thilo Lindemann, the scope of the laboratory is broadening. In particular analysis in the area of electronic scrap form a part of the day-to-day business in future.

Mr. Lindemann, on which topics are you currently working?

We are in the process of significantly broadening the scope of the laboratory and orientating it for the future. This means: while in the past we “only” undertook analytics on catalytic converters, we are now expanding the laboratory’s personnel and resources so that we can analyse a broad spectrum of materials containing precious metals. Along with electronic scrap, these materials also include ceramic from lambda sensors, for example. Particularly for new materials such as fuel cells or spark plugs, attention needs to be paid not just to pure analytics. It is also necessary to

identify ways to turn the raw material into a representative sample suitable for analysis. For this purpose we want to set up a new technical centre.

What challenges do you face during your day-to-day work?

There are a few, these include a large amount of work to document everything to meet the quality management requirements. In addition, the team is growing which also means that we need to incorporate new colleagues. The procurement of consumables is not always easy as well.



THILO LINDEMANN

DATE OF BIRTH

15.05.1988

PROFESSIONAL BACKGROUND

- Laboratory chemist
- CTA
- BSc/MSc Chemistry – specialising in instrumental analytics

POSITION AT HENSEL RECYCLING

- Head of IDO-Lab



MY STRENGTHS

Sense of responsibility, sense of duty

MY MOTTO

Stop and collect yourself (for stressful situations)

WHAT RELAXES ME

Nature and my motorcycle

WHAT IS TYPICAL FOR ME

I am very inquisitive, there is nothing that does not interest me

WHAT REALLY ANNOYS ME

When something is left untried

WHAT I WOULD LIKE

That the world once again slows down a little

WHAT I LIKE TO HEAR

Radio, because you have no choice

WHAT I LIKE TO WATCH

Die Sendung mit der Maus (educational German TV programme for children)

I AM A FAN OF

My daughter and Fortuna Düsseldorf

What do you like particularly about your new employer?

"I like the flat hierarchies. The senior management is completely open to my suggestions and I note that the senior management acts in the interests of the people in the company. Also positive is the generally pleasant way people deal with each other and the many benefits: from professional work clothing, through employee events and allowances such as the sustainability premium, there is a broad spectrum on offer. I am not surprised that the workforce identifies so well with the company."

Where exactly are the delivery bottlenecks?

For our day-to-day operations, we need hydrochloric acid and hydrofluoric acid, for example. The production of these acids requires a large amount of energy. The same applies to flasks and crucibles. While in the past, the manufacturers fired up their furnaces as required, now they collect orders until the batches are suitably large. If there is currently no stock, you could wait a couple of weeks for the next delivery. Machines for the technical centre are also subject to delivery delays because, for instance, electrical components such as printed circuit boards and controllers are not available.

How have customer requirements on laboratory services changed in recent years?

On one hand, customers always want to receive their analyses quicker. There is also less and less acceptance of minor deviations in the ppm range because of past increases in precious metal prices. Meaning that even minor deviations can cause enormous differences in payment. Particularly because batches also are becoming larger at the same time. Here arbitrary analysis are fallen back upon more quickly if purchaser and seller see differences. Due to high precious metal prices, "low grade batches" are also becoming economical for recycling, for this reason analyses increasingly contain material with low precious metal content with the hope that it will be possible to obtain a profit.

How do you ensure that the results of the analyses are "as correct as possible"?

This aspect is indeed a major challenge. Every material is very individual and you cannot simply look at its value or the precious metal content. The different materials each require a suitable analysis method. For this reason, we work continuously with reference materials certified by the German Federal Institute for Materials Research and Testing (BAM) to validate our methods. We also regularly take part in collaborative trials. Both help us to estimate how good we are with our analyses and where there is potential for improvement. We also send a selection of samples to external laboratories for comparison.

What contribution can the laboratory make to the success of Hensel Recycling?

In relation to analytics, as an in-house service provider

we are more flexible and cheaper than if this task were undertaken by an external service provider. With the technical centre we are currently establishing, we will also be able to test new material streams and transfer them to the core business in the medium term. For Hensel Recycling it is valuable that we are able to quickly screen a material for any precious metals and can provide a rough estimate of the ppm range.

What investments are on the agenda in the laboratory?

Our focus is currently on the ability to undertake the analysis of electronic scrap in-house. For this purpose we require furnaces, apparatus and air extraction systems. Everything else that is required we will procure gradually as necessary. In general, we want to have a broader scope in relation to the materials analysed. The analysis results in the area of electronic scrap are to be available in a type of electronic scrap library (ESBL for short) in the same way as we already maintain the so-called KABI for catalytic converters. This library will provide information to sales and the customer before the preparation of a quotation.

You are based in Karlstein, sales is in Aschaffenburg. How does the collaboration work?

We have good communication and are continuously exchanging information. Our colleagues in Aschaffenburg are very interested in our new methods and often take advantage of our offer to come to us with special materials. I am also in Aschaffenburg once a week to discuss questions directly.

There is also a laboratory in Aschaffenburg. Where are the interfaces here?

The laboratory in Aschaffenburg concentrates on the analysis of solids using XRF. We in Karlstein, on the other hand, are specialized in wet-chemical analyses. However, I also coordinate regularly with my colleagues there.

Many thanks for the interesting conversation, Mr Lindemann, we wish you continued success!



ABOUT PLATINUM

Useful information and why the energy transformation cannot occur without this precious metal

Platinum group metals (platinum, palladium, rhodium, iridium and ruthenium) are indispensable in modern environmental technologies. It began with catalytic converters, among other items, currently fuel cells and electrolyzers are major demand drivers.

Platinum group metals (platinum, palladium, rhodium, iridium and ruthenium) are indispensable in modern environmental technologies. It began with catalytic converters, among other items, currently fuel cells and electrolyzers are major demand drivers. To be able to still achieve the “1.5 degrees goal”, it is important to use existing resources as efficiently as possible and to replace, in particular, fossil energy sources with more environmentally friendly sources of energy. Electricity from renewable sources (sun, wind) and green hydrogen are considered good approaches.

Hydrogen – electrolyzers – fuel cells

Electrolyzers are required for the manufacture of green hydrogen. Hydrogen is produced from stored renewable energy and water in an electrolyzer; this hydrogen can be utilized in both households and industry. The hydrogen produced can also be used in fuel cells

for mobility. Platinum or iridium and ruthenium are key elements for the functionality of both electrolyzers and Polymer Electrolyte Membrane Fuel Cells - called PEMFC for short.

BACKGROUND



The European Union has set itself the goal of climate neutrality by 2050. For this purpose, in December 2019 the EU Commission presented the Green Deal – a concept with measures to achieve climate neutrality in relation to finance, energy supply, traffic, commerce, industry, as well as agriculture and forestry.

Scarce – scarcer – gone!

Many applications are competing for platinum. Among others, platinum is used for catalytic converters and diesel particulate filters in mobility and in stationary applications to convert harmful exhaust gases. In the electronics sector and other branches of industry, value is placed on the ability of this raw material to conduct electrical pulses. Medical technology uses platinum in heart pacemakers and implants, among others. Due to its high biocompatibility and cytostatic effect, platinum is also included in many cancer medicines. Particularly in China, and also in the rest of the world, platinum is popular in jewellery production.

Due to the high price of platinum, and also because the primary extraction of precious metals is not particularly environmentally friendly, efforts are underway to achieve a quota as high as possible for the recovery of these valuable raw materials from end-of-life products by using suitable recycling methods.

A minimal loss is technically unavoidable. The platinum used in medicines is also lost as far as recycling is concerned. As a result, further primary extraction is necessary even if demand remains constant.

Volatile raw material price

At the start of the 21st century, the platinum price started to increase sharply. With the general increase in the price of commodities in 2005 it passed the 1000-dollar mark and reached an all-time high of 2308.80 US dollars per troy ounce on March 4, 2008. The predominant reasons for the price increase were the growth in the US and European national debt as well as the weakening of the dollar against world currencies. A worldwide supply bottleneck, increasing industrial demand as well as problems in the producing country, namely South Africa, also played a role.

During the international financial crisis, which had its origins in the US real estate crisis in the summer of 2007, the price of platinum started to drop. From autumn of 2008 the crisis increasingly affected the real economy. As a consequence, stock shares, raw materials and precious metals collapsed worldwide. On October 27, 2008 the price in New York reached a low of 762.10 US dollars per troy ounce. The drop from the all-time high on 4 March 2008 was 67.0 percent. The crisis caused all asset classes to crash.

WHO NEEDS PLATINUM?

THE BIG CONSUMERS

MOBILITY

Whether petrol or diesel, there are platinum group metals (Pt, Pd, Rh) in the exhaust systems, which convert the harmful exhaust gases. Platinum will also be required in future drives using fuel cells.



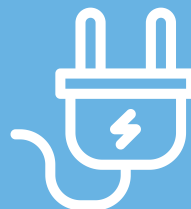
ELECTRONIC

Mobile phones, laptops, other electronic devices - printed circuit boards, RAMs and processors (CPUs) are needed to control, process and store data. The electrical impulses are passed on by means of platinum.



ENERGY TRANSITION

The energy transition can only be achieved through the consistent replacement of fossil fuels. Platinum is a key component in electrolyzers and fuel cells, among other things.



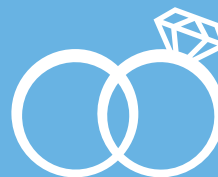
MEDICAL TECHNOLOGY AND MEDICINES

Due to its biocompatibility, platinum is the raw material of choice for cardiac pacemakers and implants. In cancer drugs, platinum can have a cytostatic effect.



JEWELLERY

Rings, chains, watches - platinum jewellery is particularly popular in China. Platinum jewellery is also a status symbol in the rest of the world.



PLATINUM IS CLASSIFIED AS A CRITICAL RAW MATERIAL
BY THE EU COMMISSION



The sudden crash was only of a short duration, even though platinum has never again reached the level from before the financial crisis.
Graphic: finanzen.net

PLATINUM SALT, INK, IONOMER

There has been a further resounding success in fuel cell recycling at Hensel Recycling in the research project BEST4Hy: along with the recovery of platinum salt, a method has been developed to recover platinum ink as well as the isomer (membrane) from fuel cells. The materials recovered can be used again in new cells – current trials are already indicating promising progress.

Diammonium hexachloroplatinate, better known as **platinum salt**, is a raw material for the manufacture of the CCM (Catalyst Coated Membrane) in a fuel cell. By using platinum as the catalyst, the fuel cell can operate at a lower temperature (60 °C – 120 °C). Using wet-chemical methods the platinum can be recovered as salt so that this raw material can be used again for the manufacture of new fuel cells (closed loop). Other applications are, for example, in the manufacturing of automotive catalytic converters, in the semiconductor industry or electroplating.

Platinum ink is a mixture of platinum and carbon and forms the layer of catalyst on the membrane in a fuel

cell (CCM). The platinum is converted from platinum salt and has a particle size of only approx. 3-5 nanometres.

Recovery rates play a major role in recycling processes. By optimizing the method, the intention is to attempt to increase the yield. The challenge is to achieve the same recovery rates during scaling. During the recycling from platinum ink, a higher yield is definitely possible because the precious metal is recycled directly and not first converted, like platinum salt.





ON THE WAY TO CLIMATE NEUTRALITY

Sascha Ziese, sustainability advisor

Sascha Ziese has been particularly committed to sustainability in the past as a member of the technical staff. As plant manager in England, he also progressed environmental projects and made Hensel Recycling UK a model company for local authorities. His interest, experience and energy made him the natural sustainability advisor for the Hensel Recycling Group – a nomination he was only too happy to accept.

Hensel Recycling has announced that it wants to be climate-neutral by 2030. How are you tackling this challenge?

Initially, we ascertained the current situation and calculated the CO₂ footprint. For this purpose it is necessary to evaluate data, for instance the electricity and fuel consumption. In the next step, we prepared a roadmap and sketched various steps to achieve climate neutrality. For example, these steps included actions such as electrifying everything where fossil fuels are still being used.

The roadmap contains the phrase “backcasting”. What does this term mean?

The method starts with an image of the future; you then calculate back to determine which action must be started at the latest to achieve the required state. Here it is necessary to take into account that important parameters may change. For example, the growth of the company, changes to the portfolio or technologies applied will also change the energy demand. As a result, the image of the future may also change during the regular evaluation process and need to be calculated again.



SASCHA ZIESE

DATE OF BIRTH

13.10.1982

PROFESSIONAL BACKGROUND

- Tool mechanic
- Mechanical technician
- Technical business manager

POSITION AT HENSEL RECYCLING

- Operations Manager, UK
- Sustainability advisor
- From July 2023: head of engineering department

MY MOTTO

Focus on the solution, not the problem

WHAT I REALLY LIKE

When family and friends come together

WHAT RELAXES ME

Reading and pursuing my hobbies

WHAT I WOULD LIKE

Health

WHAT I LIKE TO HEAR

Rock from the 80s and 90s

WHAT I LIKE TO READ

At the moment non-fiction

WHAT I LIKE TO WATCH

Documentaries

I AM A FAN OF

Technical progress, digitalisation



What is your personal motivation as sustainability advisor?

"My involvement in the sustainable future of Hensel Recycling motivates me. I am happy to take on the challenge of climate neutrality by 2030. However, the many small projects related to sustainability already in existence in the company are also motivating for me."

climate-neutral from 2030

Roadmap



Which are the largest work packages for you and your team?

A large amount of detailed work is required to prepare a sustainability report. For example, the materiality analysis during which an environmental analysis (external analysis), a corporate analysis (internal analysis) and the analysis of shareholder expectations are necessary. A student working group is providing some welcome assistance on this topic for a few months.

What is your estimation of the progress with the actions? What obstacles are you finding?

Important aspects have been addressed with the photovoltaic installation and the change to electric forklift trucks. It's more difficult with the general vehicle fleet: the necessary charging infrastructure for hydrogen, e-fuel or battery-operated trucks is currently still not available. This is where politicians must make changes. The prices for such vehicles must also drop so that they are economically viable for a business. However, the prices will only drop once the vehicles are produced and sold in large numbers.

The transformation will cost a large amount of money. How are decisions made?

For each action it is important to consider the financial consequences. When does it pay to switch to a more environmentally friendly technology? Or put another way: how long is the payback period? With increasing or high energy prices, this period reduces and makes the decision for an early switch easier.

Can you give examples of actions that show Hensel Recycling is sincere about sustainability?

The fact that the senior management has stated the goal of climate neutrality and nominated me as sustainability advisor is an indication of its sincerity. My suggestions are also met with openness. And the fact that the decision for a PV installation was made clearly before the current price turbulence in the energy sector is an indication of a sincere commitment to environmental topics.

You are currently working in the UK. How can that situation be combined with your tasks as sustainability advisor?

After working for the company for about 10 years, I have a good network of contacts at the Aschaffenburg site. Even if the physical distance is not ideal, much can be resolved by means of video conferences and using digital tools. Starting in the summer of 2023

I will be back at the Aschaffenburg site. However, I would like to take this opportunity to express my gratitude to my colleagues in the engineering department and all others who actively assisted me in my task.

We have now talked primarily about climate protection and CO₂ neutrality. However, sustainability means much more. In what other areas is Hensel Recycling involved?

If you consider the social sustainability of Hensel Recycling, the focus is on the employees: with various health-related options and ISO 45001 for health and safety, it is ensured that our employees remain in good health. For economic sustainability, we are working on diversifying our markets, for example with the projects BEST4Hy and ReSi-Norm, which are addressing the recycling of fuel cells and solar modules. In addition,

we are involved in various environmental associations and initiatives and regularly donate to social causes. Overall you can say: clearly more could still be done, but things are happening here.

Many thanks for the interesting insights and we wish you every success on your way to climate neutrality.

You will find more about the topic of sustainability on our website at:

www.hensel-recycling.com/sustainability



SUSTAINABILITY REPORT - MANDATORY OR SECONDARY?

5 questions for Prof. Dr Carsten Reuter, TH Aschaffenburg

Prof. Dr Carsten Reuter lectures at the TH Aschaffenburg University of Applied Sciences on the topics of procurement and quality management. The sustainability of supply chains has been a perpetual topic since he obtained his doctorate. At the TH Aschaffenburg University of Applied Sciences, among other topics, he manages the community for sustainable business practices for SMEs in the Bavarian region of Untermain. Currently, he is supervising a group of students who want to assist Hensel Recycling with the preparation of a sustainability report as part of a student consultancy project.

Mr. Prof. Dr Reuter, why do companies like Hensel Recycling need a sustainability report?

A sustainability report has internal and external effects and is a wonderful opportunity to show all interest groups the goals you are working towards, the route to more sustainability and what has already been achieved. The detailed depiction makes it clear to all employees that they are in the same boat because every area of the company should be involved in sustainability efforts.



The background is that sustainability does not just mean producing in a more environmentally friendly manner, but also covers social aspects such as the treatment of employees and economic sustainability.

It is also definitely an advantage for the management that as a result, a holistic approach to sustainability is taken in the company and there is awareness about risks previously underestimated or unknown.

How has the statutory framework in the context of sustainability changed in recent years?

For a long time, sustainability was purely a voluntary action. For several years there has been a trend towards introducing more and more regulations, which are becoming stricter and affecting more and more companies.

In the area of ecological sustainability, this relates for instance to the introduction of mandatory energy audits for non-SMEs during which the CO₂ emissions are determined and must be reported to the BAFA (German Federal Office for Economic Affairs and Export Control). There is for instance a step-by-step plan in the German law related to the duty of care in supply chains, this plan is intended to ensure a socially sustainable supply chain. This year, this aspect applies to companies with more than 3,000 employees, next year the limit is 1,000. Under discussion is that the German law related to the duty of care in supply chains should soon also apply to companies with at least 250 employees.

In general, even if smaller companies do not yet have a direct obligation from the statutory regulations, as suppliers they are often required by customers to comment on the defined points.

The ESG criteria are a further aspect: they give banks the obligation to check, while granting credit, the extent to which companies are acting sustainably and which measures for improvement they are planning. Here requirements are therefore transferred via the banks to the companies.

While preparing a sustainability report, what does a company that operates internationally, have to pay attention to?

It is important that the selected framework is known and accepted internationally and both the statutory requirements as well as the expectations of the stakeholders are met. The so-called gold standard for a framework is reporting according to the requirements of the Global Reporting Initiative. The German Sustainability Code and the Economy for the Common Good also offer comprehensive standard frameworks that, over the years, are becoming increasingly similar, at least in some areas.

How do you personally rate the sustainability activities of Hensel Recycling?

It is good that there is a vision. The company wants to be climate-neutral by 2030. With the development of a roadmap, specific consideration is also being given to how to achieve this goal. This activity produces a critical self-reflection of the status quo. With the publication of the goal and the roadmap, there is also the commitment: we want to improve! Many companies are still too far from this point and are underestimating the importance of sustainability.

You are currently supervising a group of students who are supporting Hensel Recycling with the preparation of a sustainability report. What can the students do here? And where are their limits?

An unobstructed view from the exterior creates a neutral image. How are other companies of the same size, in the same sector positioning themselves, which frameworks are used? The students can also provide information about which measures would be suitable in which fields and undertake research into which tools and platforms can be used to obtain data efficiently. What they cannot do is develop a vision or a sustainability strategy. This is the task of the company.

Mr. Prof. Dr Reuter, many thanks for the insights into current trends in the context of sustainability reports.

BACK TO SCHOOL

... was where Sebastian Hensel went at the beginning of the year. The Ironman finalist was on a special mission and visited the Montessori School close to Aschaffenburg. Under the motto "It pays to keep at it" he gave a speech about motivation.

As a high-performance athlete, he is only too familiar with challenging situations – whether performance slump or injuries – there are numerous setbacks that must be mastered time and again, especially if you are preparing for a goal as high as Ironman in Hawaii. However, also in "normal" life and everyday school life it is often not easy for the young to deal with setbacks and difficult situations, such as poor marks or bullying. Along with his experience from sports, Sebastian Hensel was also able to provide helpful tips about starting a career because he himself passed through various professional stages after his training and studies.

asked – starting from the daily routine of a working high-performance athlete, through specific topics such as the breathing technique during swimming, to very personal questions about how to combine sport, a profession and private life.

"The pupils were very impressed with Mr. Hensel's explanations and were able to take away a lot of information related to motivation strategies," the teacher Nela Schmitt commented on Instagram about the talk given by Sebastian Hensel.

After the presentation, there was a lively dialogue with the pupils in their final year. Numerous questions were



"It pays to keep at it!" Sebastian Hensel addressed the young auditorium with this message.

GIRLS' DAY

The Girls' Day is a nationwide orientation day about careers and studies for girls. It is promoted by the German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth and by the German Federal Ministry for Education and Research.

During the Girls' Day girls learn about professions or academic subjects in which the proportion of women is below 40 percent, e.g. in the IT, manual skills, natural sciences and engineering sectors.

Hensel Recycling, Aschaffenburg as well as our subsidiary IDO-Lab in Karlstein am Main also took part again this year.

A total of 13 girls from 12 to 16 years of age found out about our company and its everyday work processes in precious metal recycling and, during a tour of the analysis laboratory, the area of precious metal analysis.

We also provided information about the trainee position in wholesale and foreign trade management (m/f/d), which is largely dominated by male trainees.



The trainees at Hensel Recycling presented the company and its range of services on the Girls' Day.



The participants were fascinated by the variety of laboratory professions and were able to undertake experiments themselves after a tour through the premises.

WOMEN IN MANUFACTURING

The Eastern Pennsylvania Chapter of Women in Manufacturing visited Hensel Recycling North America in April. The occasion was Earth Day during which the group wanted to find out more about the topic of recycling precious metals.

Earth Day has been held for more than 50 years. Initially limited to the USA. There are now events worldwide. The intention of associations and organisations on this day is to raise awareness of climate change and the destruction of the environment.

For Hensel Recycling it was a good occasion to report to the members of the WiM (for explanation, see box) about the energy-efficient, environmentally friendly recycling of precious metals. "We were pleased to receive the inquiry from the association and immediately agreed", explains Andreas Friesen, CEO at Hensel Recycling North America.

Along with a tour through the recycling plants on the site in West Berlin, New Jersey, there was time for a chat during a joint breakfast.

WOMEN IN MANUFACTURING ASSOCIATION (WiM)

Over the course of the last decade, WiM has grown to be the only national and global trade association dedicated to providing support to women who have chosen a career in the manufacturing industry. Currently, more than 18,000 individual members representing more than 3,000 manufacturing companies have joined our growing ranks of industry professionals from 48 US states and from 47 countries. WiM encompasses manufacturers of all types and welcomes individuals from every job function – from production to the C-Suite. WiM supports by means of virtual learning, virtual career fairs, executive networking group services, a job board, meetings and conferences, local US chapters and programmes for further professional development.

Source: <https://www.womeninmanufacturing.org>



HEALTH AND SPORTS

The well-being and health of employees are of primary importance at Hensel Recycling. There is a range of – to some extent – new options with ideas for exercise and healthy nutrition.

Step by step - stride by stride

For many years already there has been the option at Hensel Recycling of taking part in the public Hensel Recycling Churfranken Triathlon. Interested colleagues prepare for the event in dedicated training groups.

Along with participation in the triathlon, Hensel Recycling also makes it possible for its employees to take part in various running events, for example the Engelberglauf. At this event our Hensel Recycling team took the first place in the team competition over 10,000 meters on 1 April 2023.

A team from Hensel Recycling also took part with enthusiasm and vigour in the indoor cycling marathon “Radelspektakel” in Stockstadt on March 4, 2023. The good thing about this indoor spinning event: 10 cents are donated to the children’s home in Aschaffenburg per kilometer ridden.



Walking and running groups during lunch break have also been established recently. As such there is also a suitable exercise option for those who want or are only able to tackle something less than the challenges approaching the extreme sport of a triathlon.

Healthy food

Hensel Recycling also wants to create awareness for the topic of nutrition. In the common rooms, bowls are regularly filled with a selection of seasonal, delicious fruits, thus providing a dose of valuable vitamins. Another offer to promote the well-being and health of employees.



Fit through your daily routine

Especially for people who work, the Deutsche Rentenversicherung offers a programme called “RV Fit”. This is a training program with elements covering exercise, nutrition and managing stress for an overall improved lifestyle. After an individual analysis and compilation of a training program, the program begins intensively (3-5 whole days). There is then training twice a week for three months to build up daily routines and to remain motivated.

Hensel Recycling makes it possible for all employees to take advantage of the program run by Deutsche Rentenversicherung.



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