

# HENRY

INSIGHT

EDITION 2017

# INCREASINGLY DIVERSE

Product range reaches new dimensions

## INTERVIEW

Clemens Hensel,  
Managing Partner

## FOKUS

Product diversification - How we are  
positioning ourselves more broadly

## JOB TEST

How we control and optimise our  
processes



# EVEN MORE VARIETY IN PRODUCTS AND SERVICES

Even when it comes to precious metals contained in electronic scrap you can now depend on us

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Last year our focus was on the company name change. At the same time, however, we started numerous projects which will allow us to offer you even more variety in our products and services.

One of these was our investment in the processing of electronic scrap. While building and commissioning the plant, we put our thoughts into accompanying services which will make execution much easier for you. The same applies to other materials that contain precious metals, such as fuel cells: We expect to see an increase in numbers in this emerging segment. To this end, we are working on intelligent recycling solutions for the economical and ecological recovery of the precious metals. As we offer services and profitable processes for more and more materials, this issue of HenRy Insight focuses on product diversification.

We have also made progress in downstream processes, such as the melting of ground material from diesel particulate filters. As their silicon carbide content means that they can't be recycled in the Karlstein plasma smelting furnace, we have worked with our Swedish partners to look for solutions and we have found them.

HenRy Insight once again provides a rich tapestry of topics for you to enjoy. Variety is very much the focus here, too. Follow us to Australia and Sweden, and join us on a journey into the history of precious metals. We hope you have an entertaining and enjoyable read..



Clemens Hensel



Thomas L. Hensel



Oliver Krestin

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HenRy Insight | 2017 Edition

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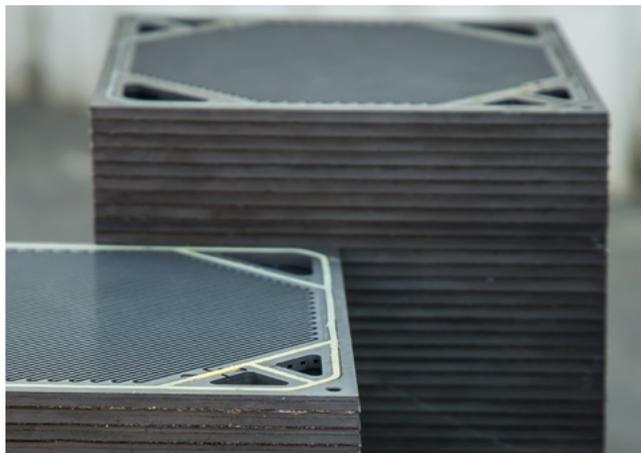
## EVEN MORE VARIETY IN PRODUCTS AND SERVICES

Nothing is as constant as change. That's why we are always ready to expand our portfolio for our customers.

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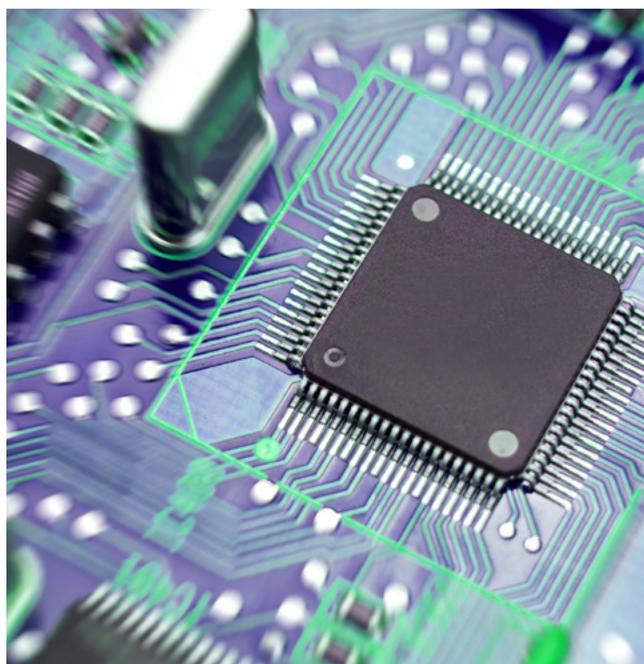
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**IMPRINT**

# CHOOSE MATERIAL

Benefit from our tried-and-tested services  
for a variety of materials containing precious metals

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Whether catalytic converters, oxygen sensors or control units – cars are full of components that contain precious metals. And the number is on the rise. As a result, over the past few years Hensel Recycling has developed numerous processes that help recover and conserve valuable precious metals from used and dismantled vehicles for secondary use. But Hensel Recycling offers much more than the recycling of precious metals from automotive applications.

## Digital revolution – only possible with precious metals

Smartphones, laptops, robots – there is hardly an area of life in which progressive digitalisation doesn't dictate the rhythm. Applications can be found in almost all industries and that means that small computers are taking over the work. Chips, CPUs, circuit boards and many other components are responsible for automatic processes, made possible by the conductive properties of precious metals turning information into electric impulses.

As with all technical products, they are replaced much more quickly than their functionality would require thanks to innovations that increase the equipment's performance. The amount of electronic scrap accrued is correspondingly large. Hensel Recycling has recognised

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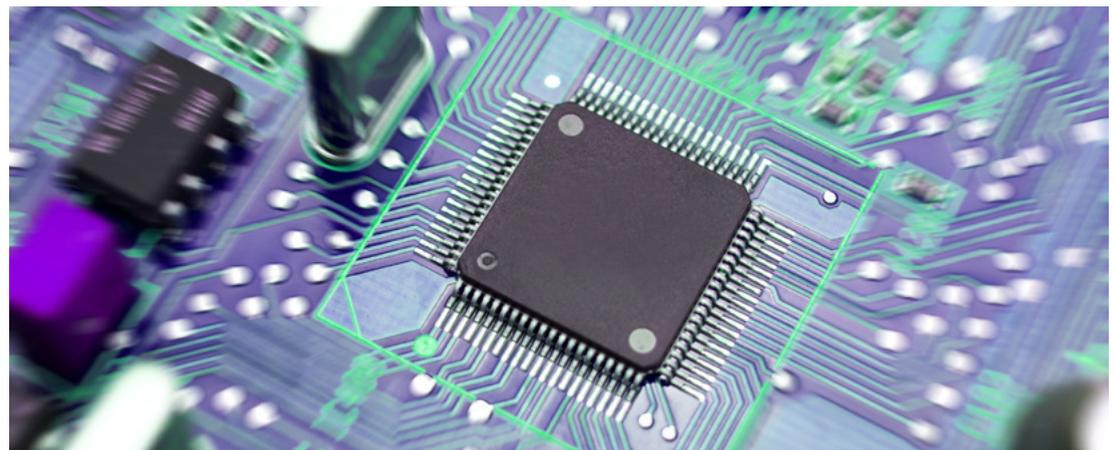
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Our customers know that we offer professional and certified recycling solutions, as well as customer-oriented services.

And the greater our range of materials,  
the more our customers will benefit.

Peter Lenz, Executive Vice President / Sales

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this: A similar approach to our process for sampling and recovering precious metals from catalytic converters is now possible for electronic scrap as well. A modern e-scrap processing plant, including integrated sampling, ensures consistent results and high recovery quotas. And Hensel Recycling also offers accompanying services, such as logistics and precious metal trading for this product range, just as we do for catalytic converters.

### The future is just around the corner

For many years now, the automotive industry has pinned its hopes on the fuel cell. Today it is considered the key technology of mobility 4.0. Numerous research funds are being directed into the development of operational fuel cells. Precious metals, particularly platinum, are essential to this alternative type of drive, ensuring the full functionality of the fuel cell. A lot of technical challenges needed to be overcome, and nowadays small series of cars are being fitted with this form of electric drive. Consequently, the first fuel cells are entering the recycling circle. Hensel Recycling is looking at options for developing processes for the commercially viable recovery of precious metals. The intention is to feed them to a clean and effective recycling process as soon as they are accumulated in larger quantities.

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We are watching the industrial use of precious metals, the raw material markets, the development of scrap quantities and the statutory framework conditions worldwide.

From these trends we will derive how we can expand our portfolio so that we can contribute to the conservation of precious metals.

Anna Marchisio, Business Development Manager



# INTERVIEW WITH CLEMENS HENSEL

## Managing Partner

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**You have worked in precious metal recycling for about 30 years now. How did you get started?**

In 1988, the Imexco Edelmetallgesellschaft in Alzenau commissioned Darmstadt Technical University to launch a study on the potential of recycling precious metals from automotive catalytic converters. At the time, I was an industrial engineering student there and my professor approached me to see whether I would like to write a thesis on it. After completing my degree, I was given the opportunity to put the theory into practice.

**How has the market potential changed during this time?**

When catalytic converters were launched in the market at the end of the 80s, we assumed that there would be a potential of 100 tonnes of monolith to be processed for recycling annually in Germany at the time. Today, with complete market penetration, the German market only totals around 500 tonnes. This is because many spent vehicles (around 2.5 million per year) are exported to Eastern Europe or Africa, along with their catalytic converters.

**In the past few years the market has changed quite a bit.**

Yes, the last few years have been quite difficult. Now, fortunately, precious metal prices have recovered and the

markets have normalised. But we must continue to keep an eye on scrap steel prices. In the last few years, for example, steel prices have fallen. Whilst the many regulations in Germany lead to a higher percentage of recyclable materials enter the recycling circle, many countries lack the motivation to recycle end-of-life vehicles; even more so when steel and hence scrap steel prices are low. That's when cars end up getting stockpiled in the yard.

**Hensel Recycling is currently investing in an electronic scrap processing plant. What is the objective?**

By building this plant, we continue to pursue our path of product diversification. Earlier examples include oxygen sensors and control units taken from vehicles. We transfer our expertise in technology and service to other materials.

**How do you want to approach customers in this new segment?**

Many of our customers also collect e-scrap. A lot of these customers have been asking us for years whether we can recycle these materials. We will of course also approach potential new customers, just as we do in the catalytic converter business. As a matter of fact, for a number of years now we have enjoyed considerable success in the e-scrap sector at our Austrian site.

**What can collectors of electronic scrap expect from Hensel Recycling?**

It goes without saying that they will benefit from our excellent processing quality. We also offer maximum precision and consistent results. On top of which, our comprehensive services also add value.

**Which projects will define your professional life this year?**

Alongside the commissioning of the e-scrap plant, we have got a number of other projects in the pipeline. One of these is the cooperation with our Swedish partners (see also page 17). Another is the operational and administrative transfer of the smelting furnace into routine daily operations with Heraeus. We will also be planning and commissioning a number of other plants.

**Last year, the company changed its name. How has the new name been received by the market?**

Generally quite positive, I think, because we got the message across that we intended: My brother and I will continue to uphold the character of the family-run, medium-sized company with the "Made in Germany" mark of quality, something which Alexandra, Ralf Duesmann and I already stood for.

# PROFILE



## Your first choice – what does this claim mean to you personally?

This statement is already entirely justified today in the catalytic converter recycling sector. We are very well known in this area and have a good reputation. Where the recycling of other materials is concerned, I see the claim that is derived from our vision as an incentive and a benchmark to ensure that our processes and services live up to the statement: “We are your first choice in the conservation of precious metals”.

## In 30 years of precious metal recycling, you’ve surely had the odd funny thing happen.

Yes, for instance: During the mid-90s, we were in the middle of building a metal catalytic converter processing plant. We proudly managed to acquire our first potential customers, even before the installation was complete. We were delighted when a large car manufacturer arranged a demonstration date with us, but somewhat naively we hadn’t reckoned with delays in the delivery of plant components. Finally, one day before the scheduled appointment, the last parts arrived. We worked the entire night. Drenched in sweat and fearing the worst, we presented the plant. It fully met the customer’s expectations and we were rewarded for the all-nighter with a large contract.

Many thanks for the candid conversation. Continued success in the future.

## DATE OF BIRTH

18.05.1960

## I LIKE TO READ

At work, news from all areas; on holiday I like to read exciting books

## PROFESSIONAL BACKGROUND

1989 – 2003:

Imexco Edelmetallgesellschaft (later Demet Deutsche Edelmetall Recycling)

Since 2003:

with what is now Hensel Recycling Group

## MY STRENGTHS

Persistence and flexibility

## MY MOTTO FOR LIFE

Fair comes first!

## POSITION AT HENSEL RECYCLING

Managing Partner

## THAT’S TYPICAL ME

My cynical sense of humour and puns that I sometimes air a little too cheekily

## I LIKE

Combining my professional and personal life so that both are enjoyable and neither loses out (e.g. Hensel Recycling Triathlon)

## I WISH FOR

More autonomy over my own time

## I DON’T LIKE

The lack of fairness, e.g. when someone benefits at the costs of someone else

## I’M A FAN OF

Eintracht Frankfurt

## I LIKE TO LISTEN TO

Ballads such as “Sound of Silence” (the remake by Disturbed!) or “Stairway to heaven”

## I RELAX BY

Endurance sport, our dog, time spent with my wife

## I LIKE TO WATCH

Sport, sunsets

# JOB TEST BY VITALIJ

## Process control in production

Hello, my name is Vitalij. I've worked for Hensel Recycling since September 2008. I started in the sample preparation laboratory. Following further training to become a technical business administrator, I grew into a process optimisation role. Today I'd like to show you exactly what that means.

My main task is to control and coordinate all movements of materials, from the moment the goods are received to the dispatch of the processed materials. This means that I always have a good overview of which materials in what quantities and in what processing status are available on our premises. What's also important here is the assessment of the quality of the materials because my role also involves matching the processing batches in such a way that they are optimised for the smelting processes of the different furnaces.

For the smelting process, we don't just analyse the material in terms of its precious metal contents. The composition of the base material, the so-called matrix, is crucial for selecting the correct processing path. This means, for example, that if the percentage of SiC (silicon carbide) from these diesel particulate filters in the plasma melt is too high, the melting conditions will be unfavourable and the quality of the process will be at risk. That's why I always arrange the batches so that the mixture of the elements is appropriate to the melt. As a control element, I have developed my own database that affords me a quick overview of the quantities, quality and processing status.





A quick analysis of the precious metals is possible thanks to the compact analyser.



Collector metal and slag are separated in the plasma smelting furnace.

In general, my role is designed to be an interface between dismantling, production, logistics and laboratory. To ensure that everything goes without a hitch, data has to be exchanged without obstruction between various software programs. Similarly the transfer of the smelting furnace to Heraeus presents a number of new challenges for me. That's why I also coordinate closely with the IT department.

As a special function, I also advise our sites and customers on compact analysers (XRF) and calibrate them to suit the customer material. To do this, I select representative samples from a standard set of cuvettes that represent different material compositions. In the past year alone, I have calibrated around a dozen compact analysers for external use. As acting radiation protection representative, I also train internal and external users on how to handle the equipment, provide support for any technical problems and repairs as well as carrying out maintenance.

## CONCLUSION

I really like my job at Hensel Recycling because it is very varied and comes with a great deal of responsibility. I am grateful that I enjoy the trust of management to be able to set up processes for others, and I am always happy if my contributing makes real process improvements possible.

<sup>1</sup> Cuvettes are special containers made of glass or plastic which are suitable for spectroscopic investigations because of their shape and cut.

# PRECIOUS METALS THROUGH THE AGES

## ANCIENT TIMES

**PRODUCTION:** EXTRACTION FROM ALLUVIAL DEPOSITS, GOLD WASHING

**APPLICATIONS:** MEANS OF EXCHANGE, JEWELLERY

THE EGYPTIANS ASSOCIATED GOLD WITH ETERNITY AND INDESTRUCTIBILITY. WE KNOW THAT GOLD WAS USED FOR MANY THINGS, INCLUDING BURIAL OBJECTS AND THE ENHANCING OF MUMMY CASKETS. FOR EXAMPLE, 225 KILOGRAMS OF GOLD WERE USED ON THE SARCOPHAGUS OF TUTANKHAMUN.

MANY GOLD RESERVES CAME TO EUROPE THROUGH THE ROMANS' WARS OF CONQUEST, WHICH INCLUDED JULIUS CAESAR.



## Middle Ages

**Production:** Extraction from hydrothermal lode and mineral veins, gold washing

**Applications:** Means of exchange, jewellery, tonics and cures, mirrors, pots and pans, etc.

In the middle ages, precious metals (gold) were valued as tonics, or even cures. They were believed to combat gout, leprosy and the plague. Gold amulets were used to prevent maleficium.

As alchemy began to emerge, the ancient vision of turning base metals into gold and silver was revisited. As we know, this didn't actually come to fruition, but in the process porcelain was invented. In the trade sector, the first glass mirrors were produced using mercury.





# INDUSTRIAL ERA

**PRODUCTION:**  
Industrial extraction from mines,  
secondary production from end-of-  
life products

**APPLICATIONS:**  
Electronics, automotive technology,  
medical technology, jewellery, and  
much more.



More than 150 years ago Wilhelm Carl Heraeus, a chemist from Hanau, achieved something that no one before him had achieved in Germany. He managed to melt platinum on a large scale - and with that laid the foundation for today's company.



Right at the threshold to the industrial age the fairy tales of the Brothers Grimm emerged. The brothers came from Hanau, near Aschaffenburg. From earliest childhood, countless tales, such as *Mother Hulda*, *The Frog King* and *The Star Money* still show today how desirable gold and silver is and how happiness is associated with them. Precious metals have a similar meaning in fairy tales from other cultures.

In the years 1897 (silver fixing) and 1919 (gold fixing) today's most notable market structures were created in London for trading precious metals.



All the gold in the world  
would produce a ball  
with a diameter of around  
25 metres and weighing  
almost 180,000 tonnes.

# PRECIOUS METALS FROM CELL PHONES AND MORE

## Hensel Recycling samples electronic scrap

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For some years now, Hensel Recycling has been expanding the range of materials suitable for recovery and conservation of precious metals. Electronic scrap was previously processed externally, but Hensel Recycling's own processing plant that was commissioned recently represents another important step in the direction of full service provider.

### Excellent sampling process

The precious metal content and the complexity of recovering precious metals with varietal purity from any type of scrap are crucial for determining the value of the material to be recycled. With most products, this can't be achieved with just a visual inspection. Instead a precise sampling process – the core expertise of Hensel Recycling – forms the basis for a fair settlement. This also applies to electronic scrap. In the newly constructed processing plant, the material is first processed in a two-stage homogenisation and grinding process so that a sample can be taken that is representative of several tonnes of material. The objective is to take an analytical sample that is suitable for wet-chemical methods in order to determine the precious metal content.

### Advice and service

Companies that deal in the initial treatment of electronic scrap or scrap traders will find that Hensel Recycling is a partner that can provide them with expert advice in terms of both, the material composition and the decision about whether tolling or purchase would offer the most profitable solution. There is also a comprehensive catalogue containing extensive information on grouping typical electronic components, such as motherboards, ICs, plug-in cards etc., in terms of value.

”

With our own electronic scrap processing plant, we can now offer customers flexible solutions, such as purchase and tolling for valuable electronic scrap.

Mirko Duesmann, Key Account Manager Electronic scrap

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### Fast settlement and small batch sizes

The electronic scrap process at Hensel Recycling primarily adds value by the fact that even small batches are very cost-effective. Also, as soon as the analytical results are available, settlement can be completed quickly and with flexibility. This means that Hensel Recycling customers don't have to collect material over long periods of time to generate large quantities, instead they can act quickly and on short notice. The immediate benefit is liquidity. Moreover, precious metal prices can be hedged when goods are received.



# CATALYTIC CONVERTER PURCHASING IN AUSTRALIA

New business model brings sustainable success



Australia, sparsely populated with a handful of cities, deserts and endless savannahs. Untouched nature, in which kangaroos, koalas and people live peacefully together. The country is extremely diverse, and the stretches of road that the purchasers of catalytic converters have to travel are long.

Our office is located in the densely populated south of Australia, near Melbourne in Victoria. It's almost 3,500 km to Perth in the West, around 3,800 km to Darwin in the north, and about 1,500 km to Brisbane in the East. These are stretches that collection vehicles can only manage with difficulty.

## Know-how creates long-term customer loyalty

Additional personnel has been employed and regional partners have been recruited to ensure that all the regions of this vast continent are covered and the markets can be properly served. A catalytic converter library specially tailored for the Australian market has been developed to make purchasing transparent. This, short routes, the ability to respond flexibly paired with Hensel Recycling Australia's proven expertise creates a strong foundation of trust, which in turn increases the readiness of our customers to do business with us.

## Extensive catalytic converter library

Purchase prices are based on the valuation of the catalytic converters. With this in mind, the precious metal analyses of the most common local catalytic converter types are continuously evaluated, collated and recorded. The data is under permanent review and constantly expanded by the Australian team. More than 4,000 catalytic converters have been evaluated since 2015 and the existing library has been extended by around 1,500 Australian catalytic converter types. The analysis of individual catalytic converters is now part of the daily routine in Australia. Of course, as well as the purchasing option, the customer also has the option to toll process and refine, depending on the volume.

## Dismantling in Australia – Sampling in Korea

The catalytic converters from our Australian customers are collected centrally at the Hensel Recycling site in Victoria. Here, the steel casings and the valuable monolith are separated. The monolith is shipped to the Hensel Recycling site in Korea, where samples are taken from the material using the precise, proven Hensel Recycling processes. All together this allows for strong synergies, fast processing, resource saving logistics and a sustainable supply chain.



We have increasingly focused our attention on the purchasing business and have expanded it significantly. The excellent on-site support and transparent pricing structure have been very well received by our customers. We will continue to pursue this business model and develop it even further.

Peter Ursprung, Head of the Australian Office

# COOPERATION WITH SWEDISH PARTNERS

## Innovative new smelting process for SiC-containing material

For some time now, there has been an increase in the number of diesel particulate filters entering the recycling circle, these filters being designed to reduce emissions from diesel vehicles in Europe. This figure will increase considerably over the next few years as vehicles registered since 2009 with particulate filters fitted as standard gradually reach the end of their useful life. The special composition of the material to be recycled will pose new challenges for the recycling industry, and a number of aspects will need to be taken into account in the processing methods, particularly in the smelting process.

### Interfering element - silicon carbide

Catalytic converters and particulate filters require different smelting conditions. The more an oven is optimised for one sort of recovery, the less suitable it becomes for the others; and when mixtures with different ratios come into play, it starts to get really complicated. A material quantity of just 3 % from diesel particulate filters, interferes with the classic smelting process for monolith. This in turn prevents a clean separation into collector metal with a very high precious metal content and slag. This is because diesel particulate filters – in contrast to exhaust gas catalytic converters for petrol engines – contain sil-

icon carbide (SiC) which acts as an interfering element. Silicon carbide is a popular filter material, particularly in diesel particulate filters, as SiC filters provide excellent performance and have a high smelting point of 2700 °C.

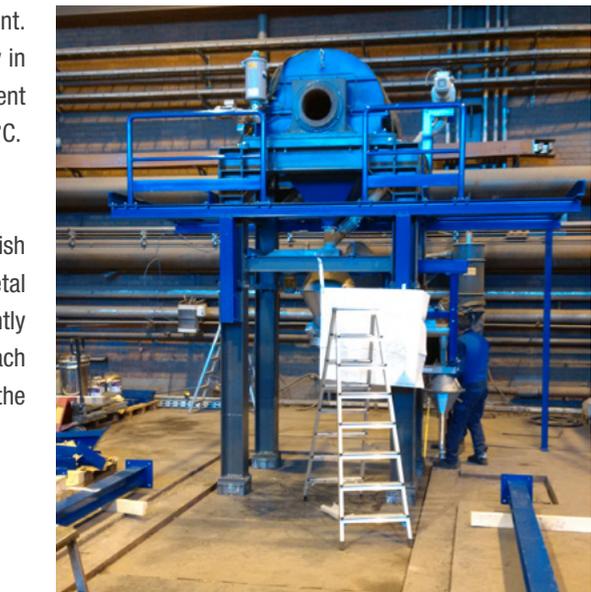
### Strong partners for combined expertise

Hensel Recycling is working together with the Swedish partners ScanArc Plasma Technology and Arc Metal on a joint solution for cleanly, safely and efficiently smelting materials with any silicon carbide content. Each partner brings its own specific company expertise to the partnership.

”

Our contribution comes at the start of the value chain: We plan and install a suitable sampling plant with integrated sampling system. ScanArc and Arc Metal contribute their expertise in pyrometallurgy and the refining of catalytic converters.

Oliver Krestin, Managing Director



# NEWS TICKER

## HENSEL RECYCLING SUPPORTS “KIDS AND TECHNOLOGY” ROTARY PROJECT

As a small means to counter the ever increasing shortage of professionals in technical vocations, Rotary encourages kids to be interested in natural science. To this end, the club has developed a programme that is currently running in 22 primary schools in the towns and districts of Aschaffenburg and Miltenberg. The pupils are discovering the basic principles of mechanics, electricity, magnetism, and pneumatics. Using simple modular systems that they can assemble in class or develop at home, the children, through play and experiments, stimulate their curiosity and interest in technical matters. As a co-sponsor we hope the project inspires kids to consider technical professions in the future. “We are delighted to support this project because children are our future!”, stresses Managing Partner Thomas L. Hensel.



## HENSEL RECYCLING ON LINKEDIN AND XING

Initiating and maintaining business contacts - that is the purpose of the professional networks LinkedIn and XING. These platforms also give companies the opportunity to publish a profile and their current news. Hensel Recycling is now posting regular information updates here. Click on it; we are happy to welcome new followers.

LinkedIn



XING





## STADTRADELN

Radeln für ein gutes Klima

### CYCLING FOR THE CLIMATE

Aschaffenburg in the Main lowlands is particularly good for cycling. The 'City cycling' nationwide campaign is designed to get people enthusiastic about bike riding, for example, on their way to work. In the period from 26.06.-16.07.2017, the registered participants collect points for every kilometre cycled. There are team and individual rankings.

This year, for the first time, Hensel Recycling will also be taking part in this sporting initiative as sponsor. "This will allow us to showcase to the region that we are serious about preventing climate change and preserving resources", explains Managing Partner Clemens Hensel about the involvement.



# BE THERE

With the Hensel Recycling

## Churfranken Triathlon 2017

on 16.07.2017



### Olympic distance

(only individual ranking possible)

Swimming: 1.5 km

Cycling: 43 km

Running: 10 km

### Sprint

(individual ranking and relay possible)

Swimming: 0.5 km

Cycling: 20 km

Running: 5 km

Further information at

[www.tripaul.com](http://www.tripaul.com)

# HENRY INSIGHT IS A FLIP-OVER MAGAZINE.

Bitte wenden, um die deutsche Version zu lesen.

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