



3/2017

Extracts in English

Open-heart surgery: patient in good health

GMHütte · II of III completed: modernisation of continuous caster progressing according to schedule.

Very important news first of all: Phase II of the “continuous caster modernisation” mega project has been completed successfully and – what is even more important – without any accidents (!). On schedule on 14 August 2017, and in a state of extreme tension, a small group of personnel involved in the modernisation put the first heat through the gleaming new caster

after the production stoppage – with a positive outcome. Even though all involved were pleased and satisfied at the end of this mammoth effort, which had begun on 17 July, they were also honestly exhausted. Read more about the breathtaking project, and the personnel who took part, in our report ...

→ Detailed report on page 2



New control panels also add a new luster in the torch-cutting control room.

Photo: Oliver Pracht

Everyone is delighted – and exhausted

GMHütte - Modernisation Phase II: optimisation of quality characteristics.

“It was already apparent before my appointment that something had to be done.” Michael Merz, Head of the Steel Production business unit and Technical Managing Director of the GMH Group, knows exactly why the investment was unavoidable:

“The requirements of automotive industry customers are becoming ever more exacting, and the influence from China is also noticeable in the meantime. Topics such as electromobility and lightweight construction are omnipresent for the automakers, meaning for us steel producers that we have to concentrate more than ever on the topic of quality in order to meet the demands of our customers. The GMH Group needs to maintain its pole position in this changing environment.”

Phase I of the modernisation was implemented last year, followed by Phase II this year – with the focus on the optimisation of quality characteristics – an aspect that has previous history.

Already some years ago, a trial strand had been installed in order to acquire knowledge that has now been beneficial in optimising the six new strands. The objective was to build a state-of-the-art caster with a view to meeting customer requirements for the next 10 to 20 years. It was a question, for instance, of minimising segregations and possible porosity and cracking.

Before the summer shutdown even started, important equipment was set up that would not have a direct influence on ongoing production – among which the new water management system in front of the melt shop, the new product cooling system, the dummy-bar filters – a particular innovation that alters the optical appearance of the caster the most visibly – and the air-conditioned enclosure for the tundish control room personnel.

To identify and preclude possible production flaws from an early stage, integration tests were conducted at the manufacturers as a means of examining all the components and groups of systems for their operability.

On Monday, 17 July 2017, the signal was given for the very closely synchronised project phase to commence. Once the last heat had left the 30-year-old caster, some 150 external personnel from around 40 outside companies would begin the enormous demolition task, starting with the 'substance' of the old caster. Within a week there was almost nothing left of the old “treasure” – except for a deep black pit. The caster was gutted down to the foundations, astonishing many an employee. “They’re taking the entire melt shop apart!”, was to be heard in many places – an impression that was not completely false, either, due to the major repairs that were going on at the same time.

The leading project team faced the huge challenge of coordinating all the sub-projects including their respective time schedules with one another. According to the head of the project, Oliver Brune (Head of New-builds, Planning and Construction), "For comparable projects there is usually a project team encompassing 20 to 30 persons. We were only eight in number, the advantage being short coordination processes. But woe betide us if just one were to drop out ...!"

For that reason there were coordination meetings held in the mornings and afternoons, thus keeping everyone abreast of the current situation and providing the possibility to respond directly to anything unforeseen.

"But let us not deceive ourselves here", says Oliver Brune, "anyone who has worked on a project will know that even the best laid plans can go awry and that fate also sometimes works against you."

And there was an abundance of such challenges. For instance, there was the fact that there was no standby unit apart from this continuous caster. And there were these incredible time constraints. Also, there was the wish to make the best possible use of the local spatial conditions.

"To also see that what has been thought up in theory in all of our heads also functions in practice is splendid and a giant confirmation for all involved."

GUIDO WENDLANDT

"A greenfield project would have been far simpler", according to Brune, "but that just was not possible here at this site. But for 6 centimetres, we optimally used the area that was available. A made-to-measure fit."

Besides the dummy-bar tilters, the pinch roll unit baseframes that were installed at the start of the assembly work were the largest components at more than 50 tonnes in weight. They had been ready-assembled and were lifted precisely into position, to within a tenth of a millimetre, by crane (also newly installed during the summer stoppage).

Guido Wendlandt, Head of Ingot and Continuous Casting Operations, is also highly delighted. "To also see that what has been thought up in theory in all of our heads also functions in practice is splendid and a giant confirmation for all involved." It was indeed important that, together with the plant and equipment builders from the external service providers, the GMH melt shop personnel were able to contribute their very own GMH know-how to the project.

The novel feature of the caster is the dummy-bar systems, because the new rigid



dummy bars replace the old horizontal system. From now on, six strands will 'hover' as high as 30 m, beneath the shop ceiling, when the casting of a new sequence starts – a motion sequence reminiscent of ballet choreography.

The advantage of this rigid system is that, purely in spatial terms, it is located upstream of the torch-cutting machines and involves less effort in the way of set-up times. Rigid dummy bars of this radius, length and thickness are also a novelty for the plant manufacturer. And customers can expect better quality as a result.

The torch-cutting control room also has new features, namely new control electronics including control panels along one side. The colleagues entrusted with this equipment have been trained locally by the service provider, yet have also contributed their many years of steel production expertise to the programming work.

In future the personnel will have to rely ever more frequently on the technical data provided by the control programme, because it is no longer possible to have the cast strands in direct line-of-sight as previously. Instead, modern camera systems will now be used for that purpose.

A lot of work still awaits GMHütte, however. Thomas Wurm, Head of Technical Customer Service, sums it up in the following way: "We have acquired a new instrument – but not everyone who has a piano at home can also play it perfectly." The period ahead will show what qualitative progress GMHütte can achieve with the new caster components.

In the upcoming modernisation phases during the next stoppages, GMHütte intends to improve the logistics including the

Dummy bars at the start of casting: as high as 30 m, beneath the shop ceiling.

Photo: Oliver Pracht

Continued on the next page



onward transfer of the strands. A change in format from 240² to 245² is also scheduled for the next summer stoppage.

But for the moment everyone is delighted – as well as exhausted. The casting and maintenance personnel are happy. And Tim Rekersdrees (Melt Shop Manager) also says he is pleased and delighted to have carried out the project without any accidents:

“When you see what has been achieved here in the melt shop, it

fills me with great pride – as well as with the certainty of having witnessed something special. The

“When you see what has been achieved here in the melt shop, it fills me with great pride – as well as with the certainty of having witnessed something special.”

TIM REKERSDREES

impressions we have gained during this period are extremely varied. The outcome is a continuous caster embodying state-of-the-art steelmaking technology – and in some respects is unique in this constellation. Thank you to all the colleagues and service providers involved who have ensured that everything has come together.”

mm ■



After the successful re-start of the caster there were relieved and proud expressions all round.

Photo: Thomas Schmücker

Back on track

Continuing to implement the right measures in response to market challenges

Dear employees,

Some positive news to begin with – this year we are on target once again. This is the brief summary of the 2017 financial year so far. The “Future GMH Group” programme launched in 2016 – as expected – is supporting this development. Measures are being implemented according to schedule and the effects so far marginally exceed expectations. Such a development is by no means to be taken for granted, however, and therefore I would like to express my sincere thanks to all employees for their contribution. In addition, we are experiencing a slight economic recovery – although we cannot overlook the fact that general conditions continue to be very demanding. Prices for electrodes, for example, have increased seven-fold due to tougher Chinese environmental legislation. And we cannot produce steel without electrodes. Energy costs and network charges continue to rise, and we are also confronted by significant price increases in connection with other cost items.

Midway through the year, the GMH Group is slightly above target in terms of the result as well as gross profit. Nevertheless, we will have to continue working hard to achieve our objectives for the coming years.

We, as the GMH Group, are facing the challenging task of establishing a competitive and secure future position for ourselves in a fundamentally altered environment. New globally operating competitors with different cost structures to ours are exerting considerable pressure in certain areas. We are rising to the challenge of this competition. Further optimisation of cost structures is our utmost priority. The global market, with regard to the steel industry, is stagnating. High costs and consolidation pressure



Thomas Löhr

Photo courtesy of the company

prevails, and this is particularly noticeable in a high-wage country such as Germany. We must respond with appropriate measures. The Future Group programme needs to be established on a long-term basis, and continually utilised to define new projects. New ideas are essential to secure future sustainability of the Group.

It is perfectly logical, therefore, that our new organisational structure combines the strengths of the GMH Group wherever this provides potential to improve the cost structure, make processes shorter and more effective, as well as accelerate the exchange of knowledge and information and reduce the time it takes to respond. No single location has to be able to do everything at the same time. Certain tasks can be completed more efficiently on a centralised basis and thus make all locations even more professional. And all these measures are for the benefit of our customers. Our maxim is: as centralised as necessary, as decentralised as possible.

Not all companies of the Group are

currently working at a profitable level. Colleagues are working hard on restructuring measures to enable these companies to exist on the extremely competitive and distortive markets. This is by no means an easy task, and one in which some employees have also been personally involved to a certain extent with collective agreements for the future. Such support deserves our utmost respect and recognition. However, only profitable companies can finance growth. Further intensive endeavours are therefore still required. Over the long term, loss situations cannot be accepted.

This year we are going to make investments in new machinery and equipment in the three-digit million range. Such investments in the future sustainability and competitiveness of the GMH Group support the new direction we are pursuing to achieve future success.

A look at important key figures such as gross profit, EBITDA and cash flow, immediately shows that our clear focus on core business and improvement of our cost structures is making us, once again, a healthy and strong group with a clear orientation. The GMH Group is in growth mode, which is a clear sign that the structural changes are moving us in the right direction and reaping the first rewards.

We can only achieve success in our market and competitive environment if we work collectively. The prerequisites are now there – so let's work together as the GMH Group, and achieve our objectives.

Glück auf!

Global Partners – Global Leaders

Mannstaedt · More than a trophy and a handshake: Toyota award for “Global Partner Supplier” also includes a 3-year contract.

Mannstaedt has been bestowed a special honour. At the Japanese headquarters of Toyota Industries, the company has received the award for “Global Partner Supplier”. The award was presented by Toru Inagawa, Senior Purchasing Officer of Toyota Material Handling Group (TMHG). It was accepted on behalf of Mannstaedt by Guido Glees (Head of Sales, Material Handling) and the two Area Sales Managers, Erk Lehmler and Peter Himmelstein.

Among those to congratulate them were also Takehiko Oishi (TMHG Deputy Chief Purchasing Officer), Kengo Imaeda (CPO for all plants in Asia and South America) and Kevin Alexander and Giorgio Polonio (CPOs for the plants in North America and Europe).

The “Global Partner Supplier” award has been presented only three times thus far – and Mannstaedt is the sole supplier from the steel sector to have received it. To achieve this, the supplier must deliver to all the operating locations of the Toyota Material Handling Group and account for a correspondingly high proportion of supplies that are strategically important for Toyota. At over 42 percent, the Troisdorf-based company is by far the largest supplier of special profiles to the Toyota Group. Conversely, the Japanese are meanwhile the company’s most important customer.

The close relations with Toyota Industries – the global No. 1 among material handling equipment manufacturers – have already existed for decades. And over the past few years it has been possible to steadily increase sales and revenues particularly where the Toyota Group is concerned.

The award, incidentally, is accompanied by a 3-year contract. It not only secures the present supply share for Mannstaedt but also opens up options for a great many new projects – and thus for deeper cooperation commercially and technically. Mannstaedt is, by the way, the leading



Toru Inagawa (Senior Purchasing Officer, TMHG) and Guido Glees (Head of Sales, Material Handling Mannstaedt)

Photos courtesy of the company



Those presenting and receiving the award had every reason to be delighted (back row, from left to right): Ryoji Kito (TMHG), Giorgio Polonio (CPO European Plants), Takehiko Oishi (Deputy CPO TMHG), Kevin Alexander (CPO North American Plants) and Kengo Imaeda (CPO Brazil and Asian Plants). Front row, from left to right: Peter Himmelstein (Area Sales Manager, Mannstaedt), Toru Inagawa (Senior Purchasing Officer, TMHG), Guido Glees (Head of Sales, Mannstaedt) and Erk Lehmler (Area Sales Manager, Mannstaedt).

manufacturer of forklift mast rails for the material handling equipment industry. The company supplies to nearly all leading forklift truck manufacturers globally. The sales volume has been raised enormously in the past few years to, in the meantime, 100,000 t special profiles.

Guido Glees ■

THE OWNER'S VIEW

Dear GMH Group employees,

When I joined GMHütte in the 1980s, there was a sense that our world was coming to an end. There were murmurings in the steel industry that rail transport was on the brink of extinction. The 'death of the railway' was considered imminent because the new 'Transrapid' monorail was fast becoming reality in Germany. But we all know the outcome of that story.

Now we are experiencing the next 'apocalypse'. Diesel is to be done away with.

When cyclists become experts on propulsion and persons with a strong tendency to hysterics become specialists on particle pollution, then one thing is certain: the debate has gone off the rails, driven out of control by contributions based on an insufficient smattering of knowledge and incorrect facts. So let's please keep calm and sort out the facts. Firstly, it is quite clear that there was cheating in connection with emissions testing for certain models. The courts are meanwhile conducting meticulous investigations to clarify the facts. One thing in this respect is already clear – it is going to be expensive.

Secondly, the diesel engine emits less climate-damaging CO₂ than a petrol engine – consumption is lower where the compression ignition engine is concerned. The debate has been politically instigated. It is true that diesel engines produce more nitrogen oxide, but because engines are becoming increasingly

cleaner, the emissions are being consistently reduced. This trend is set to continue.

Thirdly, the ongoing wrangling about limits is more closely connected with voodoo than based on scientific facts. Why is the permitted amount of nitrogen oxide per cubic metre of air 950 micrograms at industrial workplaces, 60mg in an office and 40mg on the street? Flatulence from cattle as well as emissions from BBQs and small fires are more harmful sources of air pollution than German diesel, according to risk researcher Gerd Gigerenzer.

Fourthly, electric cars are not the perfect solution either. The battery, charging process, electricity, raw materials, waste disposal – there is still much to be clarified in this area. Despite generous purchase incentives, electric cars are not proving particularly popular. And this is because car buyers in Germany – perhaps the most critical in the world – are not completely convinced by the overall benefits of e-cars.

Neither buyers nor industry, nor the global market nor employers want 'either/or' dirigisme. E-mobility is very appropriate for urban centres, provided the electricity is clean. For long journeys, however, diesel will remain the more viable option for some time to come. It is perfectly feasible that in a few years' time fuel cells or new hybrid-strategies may transpire to be a better solution. And this would be a good



“Whatever the future holds, the companies of the GMH Group will be at the forefront.”

Photo courtesy of the company

development, too. There is no single “best solution”. It is not a question of steel or carbon, diesel or e-cars but rather the smartest, most effective and most environmentally friendly way of combining tried-and-tested and new technologies.

And because the GMH Group provides innovative solutions for a material which can be used in many possible ways, we are a good partner for our customers in the mobility sector. Whatever the future holds, the companies of the GMH Group will be at the forefront.

Yours

Andreas Renze during his presentation
Photo courtesy of the company



Joint approach

GMH Gruppe - 4th Forming Technology Symposium in Moscow: Expert symposium offered opportunity to present capabilities to Russian forging industry.

GMH Blankstahl and Schmiedewerke Gröditz teamed up in Russia and used an expert symposium for the Russian forging industry to present their expertise and forging process solutions.

The symposium took place at the 'Metalloobrabotka' in Moscow, an international exhibition for equipment, instruments and tools for the metalworking industry. The symposium was initiated by Swiss enterprise Hatebur Umformmaschinen AG.

"The aim of our taking-part was to present especially the

rolled, bright and tool steel expertise of the GMH Group more closely to the professional audience," explained Marco Altenhöfer, Head of Sales, GMH Blankstahl. For this purpose, Andreas Renze (Sales and Marketing, GMH Blankstahl) and Carsten Wolf (Technical Customer Service, Schmiedewerke Gröditz) prepared – and jointly gave – a presentation.

The 150 symposium attendees – mainly from the Russian forging industry – showed great interest, as Wolf confirmed.

"Through our participation we

made first customer contacts. In particular, though, we are now better able to assess the needs of the Russian market. It will now be a matter of identifying sales potentials and intensifying the contacts that have come about."

During this important step they will be supported – as they were already before and during the entire symposium in Moscow, incidentally – by the staff of the GMH Group's representative office in Saint Petersburg.

Andreas Renze ■

Customer satisfaction will rise even further

Walter Hundhausen · New order centre simplifies planning.

Walter Hundhausen has created a new department, an order centre, the aim being to turn fragmented planning into a centrally managed, integral backward-scheduling system.

Previously, the individual production steps had been planned on a department-by-department basis at the Schwerte location. Planning in this local manner, involving different responsibilities, led to interface problems and information becoming lost. Different IT solutions also made it difficult to have any integral, higher-level overview of the inventory situation.

Fragmented planning

The scheduling for the moulding plant and core shop used to be done under the responsibility of the foundry management by schedulers who used in-house software – the aim being to try to achieve optimum utilisation of the plant and facilities while having to take account of the many technical dependencies. The scheduling was based on the customers' orders and the lead times that these involved. The castings were then booked into the raw-casting store.

As the next step, the “raw-casting store inventory” was managed by schedulers under the responsibility of the finishing shops. Besides the capacities available in the foundry's own fettling shop there were several external service providers who cleaned and dressed the castings produced by Hundhausen. The finished castings were, as a final step, booked into the inventory of the dispatch department and were thus ready for dispatch.

Once they had been received for dispatch, it was possible for the sales department to make arrangements for the castings to be dispatched to the customers or downstream processors.

Order centre

The operations planning and scheduling personnel had previously worked apart organisationally and spatially – which meant lengthy communication channels and many telephone calls between the departments. Now they have been brought together both organisationally and spatially within the “order centre”.

They can now conduct all the planning centrally and cross-departmentally by means of a backward-scheduling system. They are also able to take account of current capacities from one location to the other and define deadline compliance “keystones”.

Another helpful aspect has been the standardisation of the software, which comprises only SAP and MES. A uniform EDP platform provides, among other things, the latest inventory overview at all times and does not need updating in-between several programmes.

As the personnel work in directly neighbouring offices, the channels of communication are thus short. In the event of there being customer supply bottlenecks, the dispatch department, which maintains contact with the customer, can coordinate directly with the schedulers for the core shop, moulding plant and finishing shops, thereby enabling the customer to have the latest information quickly and definitively.

Only a few months have gone by and it is possible to say that taking this step was correct and important. The new department will continue to grow closer together and customer satisfaction will rise. The resulting expectation on the part of Walter Hundhausen is that the ability to meet deadlines will constantly improve.

*Dr. Axel Justus
and Maik Lücke* ■



“We have enlarged our network significantly and been able to initiate related projects, opening up new doors especially for the future.”
MICHAEL KOLLENZ Stahl Judenburg



Now for the crucial phase

Stahl Judenburg · Research project worth millions involving the Judenburg-based company

How to conserve more than half of the raw materials used in industrial production – international partners and higher education institutions have, for somewhat over two years, been working together with Stahl Judenburg to achieve this objective. The cooperation is taking place within the framework of the MEMAN (Material and Energy Flow Management) EU Horizon 2020 Project.

The ambitions are far-reaching, and the targeted impact probably even more substantial: around half of the energy, steel and working materials, such as lubricants, oil and tools, used along the industrial supply chain are to be conserved in future. The international research project is intended to sound out possibilities and potentials.

Expressed in simple terms: the research will involve a detailed analysis particularly of the supply chain from vendor to end producer. “It is there that the greatest savings potentials are to be found,” explains Stahl Judenburg managing director Thomas Krenn regarding the research project.

The primary impact of achieving this will be a better ecological footprint. Other benefits will include higher quality through process optimisation and, as a result, a longer product life.

Stahl Judenburg project manager Michael Kollenz also has high expectations of the project. “From input material to working materials, such as oil and lubri-

cants, to ideally coordinated production steps: we have many opportunities here to improve the entire process through to the end product.”

Higher education institutions, universities and industry leaders from six European countries are working together on the project. By doing so, all participating will benefit from the intensive exchange between experts, research institutes and enterprises.

Being a production company, Stahl Judenburg ensures that the project is based on a realistic frame of reference. As Michael Kollenz explains, “We make the process data from our production available for the research project. Experimentation is also carried out at our company.”

MEMAN is already in its end phase. Once the actual state of the supply chain had been examined, all the data and processes were examined. “At present”, according to Michael Kollenz, “we are conducting a root cause analysis and determining where flow inefficiency is at its greatest.” But he also knows that the project can already be viewed as a success in some ways. “We have enlarged our network significantly and been able to initiate related projects, opening up new doors especially for the future.”

rb ■



Standards and dimensions

Besides the classic shipbuilding grades, Mannstaedt produces bulb flats in grades to DIN EN 10.025 (general steel construction) or DIN EN 10.225 (off-shore applications). Acceptance inspections are possible in accordance with DNV-GL, LR, BV or RINA. A CE mark including Declaration of Performance in compliance with EU Construction Products Regulation No. 305/2011 has been issued for structural steel grades. All profiles can be clearly and permanently marked for reliable identification. Mannstaedt currently produces bulb flats in the HP 80-240 range. Other dimension as well as special sizes, tolerances and grades are available upon request.



Scrutinising look at a double-bulb flat
Photo courtesy of the company

A profile for many customers

Mannstaedt - Bulb flats are an indispensable component not only in classic shipbuilding

Bulb flats – most commonly familiar from their use in shipbuilding – are at first glance simple hot-rolled steel profiles produced to DIN standards. They are not only considered cost-effective but can also be used universally.

Their main use, as already indicated, is in shipbuilding where they serve as stiffeners, for example in ship hulls and superstructures.

The tried and tested profiles from Mannstaedt are also used, however, in the manufacture of railway wagons – among other things the construction of car transporters. Other fields of use

include classic steel bridges and hydraulic steelwork (for instance, flood- and sluice gates).

One special case is the bulb flat with double bulb (DHP). Because of their size,

though, these profiles are not currently rolled as double-bulb flats. Instead, Mannstaedt manufactures them in cooperation with a welding enterprise classified in accordance with DB (Deutsche Bahn) standards. These profiles can be rolled in one piece in any length up to 24 m and fabricated, at present, in dimensions as wide as DHP 480 (480 mm).

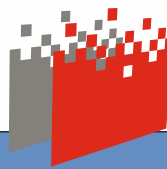
Mannstaedt (double-) bulb flats have a high surface quality. Furthermore, Mannstaedt has the capability to meet closer customer-specific tolerances than are required in DIN standards.

Ulrich Klein ■

Would you have known?

Bulb flats

A bulb flat (abbreviated designation HP) is a flat steel profile that has a ridge (or 'bulb') running along the entire edge of one flat side, hence also its name.



Stiftung
Stahlwerk Georgsmarienhütte



It's only possible to see the blue circles – instead of small segments of the installation – from one very specific position (the installation will remain on view until 31 October).

Photo: pkm

It's all a matter of the right perspective

Art lovers are in for a (blue-tinged) surprise in Osnabrück.

Anyone walking down Marktstraße towards the Marienkirche (St. Mary's Church) in Osnabrück, and looking around to the left and right, will see a seemingly meaningless jumble of blue strokes, lines, curves and squiggles adhering to both sides of the outer walls and facade of the church. What's going on here?

The tangled puzzle can only be solved from one very specific position. If you stand in front of the cathedral (Domhof) and look towards the Marienkirche, you suddenly become aware of an optical illusion. From this position, all these

blue markings miraculously and unexpectedly come together to form four circles (reminiscent of the Olympic rings). They look as if they are hovering over the street between the buildings.

A similar installation (in red) can be seen in the nave of Kunsthalle Osnabrück (a former Dominican cloister). The creator of the two installations is Swiss artist Felice Varini. The project, which cost a total of EUR 160,000, would not have been possible without the support of sponsors – including Stiftung Stahlwerk Georgsmarienhütte (Georgsmarienhütte Steelworks Foundation).

In order to affix the blue-coloured adhesive aluminium tape onto the Marienkirche at a height of more than 50 metres, the persons scaling the facades had to be equipped with professional mountain climbing gear. As an aid to positioning – which took place in the dark – a projector was used to beam the corresponding rays onto the buildings and church facade. A total of 80 people were involved in setting up these creations, under the direction of Varini.

Norbert Meyer ■

glück auf on the move



Make the connection!

Photo: mk

This time, it's a walk in the park to find out in which city Martina Petry is reading her *glückauf*, as she is posing in front of Thomas Schütte's sculpture "Nuclear Temple". For those of you who have not yet been there, maybe this hint will point you in the right direction: If the form of the sculpture reminds you of a minster, you are only one letter out.

Send your reply to m.krych@rro-gmbh.de or (by postcard) to Matthias Krych, GMH Recycling GmbH, Rheinstraße 90, 49090 Osnabrück. Closing date for entries is 14 November 2017. If more than one correct entry is received, the winner will be drawn from all correct entries submitted.

And where is your photo?
Would you also like to submit a picture puzzle? Just take a photo featuring *glückauf* in the foreground. In the background there should be enough specific details to be able to recognise in which place or in which city the photo was taken. Mail your photo to m.krych@rro-gmbh.de.



Photo: privat

Did you know?

Hartmut Gattmann is reading his *glückauf* in the Namib Desert (Namibia). The winner, Birgit Götschl (Stahl Judenburg), was drawn from all correct entries submitted (thank you for taking part).

Congratulations!
(The judge's decision is final.)



YOUR PRIZE!?

Analogue and digital

This time your prize is a black writing case with an A4 writing pad and a calculator, a 4GB USB flashdrive with laser engraving as well as a metal ballpoint pen case (also with laser engraving).

SPOT-THE-DIFFERENCE PUZZLE – 5 TO FIND

It is not so easy: spot the five differences between the original and the altered picture. What is missing from the altered picture? This time the original photo was taken at GMH Recycling Osnabrück. Felix Treppschuh from GMH Recycling Osnabrück captured the shot and manipulated it to incorporate the alterations. If you have trouble spotting all five differences, you will find the solution to the puzzle online at www.glueckauf-online.de.



Masthead

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