

# EISENBEISS NEWS

## INNOVATION IS THE DRIVER OF COMPETITIVENESS



## INNOVATION DETERMINES PROGRESS AND INVESTMENT COSTS IN PLANT ENGINEERING!

THE DRIVE – THE GEAR SYSTEM – IS THE KEY COMPONENT FOR HIGH EFFICIENCY.

### IN THE SPOTLIGHT:

- | SPECIAL-PURPOSE GEAR FOR 3-ROLL STAND
- | COST BENEFIT THROUGH DOWNSIZING
- | INCREASING PRODUCTIVITY

### IN THE SPOTLIGHT

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Innovations increase productivity and efficiency

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Eisenbeiss, the trendsetter in the special-purpose gear industry

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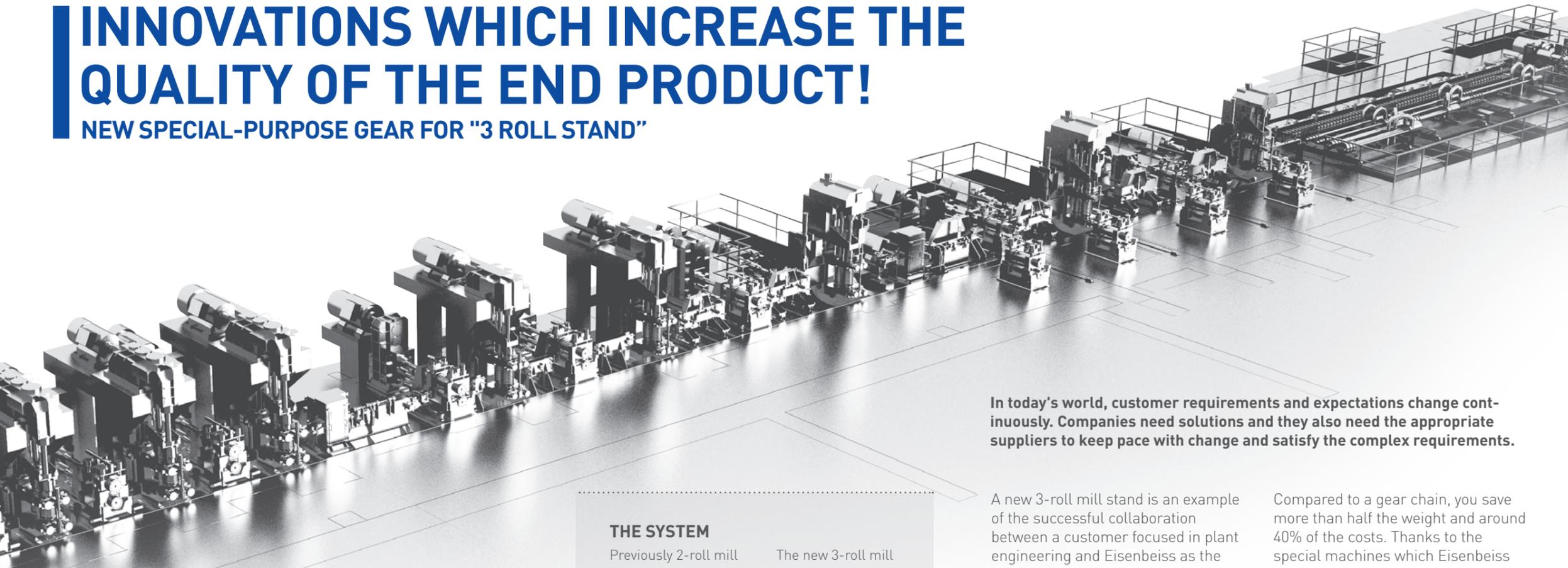
Downsizing – innovations in gear engineering which pay off for the customer

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Higher productivity through i:GEAR 4.0® at steelworks

# INNOVATIONS WHICH INCREASE THE QUALITY OF THE END PRODUCT!

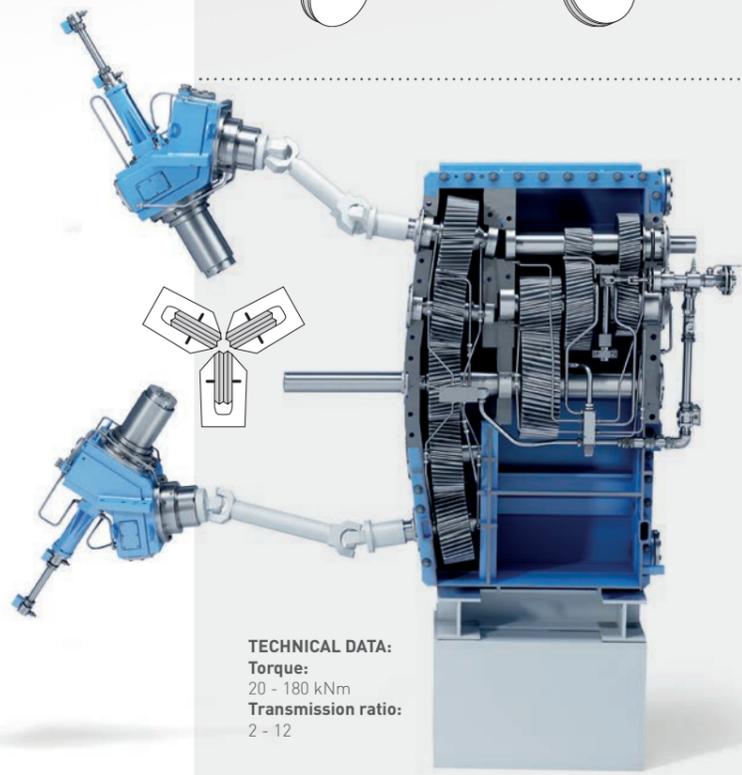
NEW SPECIAL-PURPOSE GEAR FOR "3 ROLL STAND"



In today's world, customer requirements and expectations change continuously. Companies need solutions and they also need the appropriate suppliers to keep pace with change and satisfy the complex requirements.

## THE SYSTEM

Previously 2-roll mill      The new 3-roll mill



**TECHNICAL DATA:**  
**Torque:**  
 20 - 180 kNm  
**Transmission ratio:**  
 2 - 12

## A NEW GEAR WITH MANY BENEFITS INCLUDING:

- A 50% reduction of gearbox weight results in approx. 40% costs saving compared to a gear chain
- Extremely smooth running, optimum gear mesh under load, effectiveness improved 25%
- Thanks to conical wheels the working angle of the drive shafts stays on a practicable scale (which does not restrict service life)

Another highly cost-effective solution from Eisenbeiss.

A new 3-roll mill stand is an example of the successful collaboration between a customer focused in plant engineering and Eisenbeiss as the gear system specialist. The ever increasing requirements in terms of the precision of rod and wire, rod and bar require not only new mill stands but also new gear system concepts (as will be described here in more detail).

The new 3-roll stands are powered by a central motor and transfer gearbox which drive the straight centre roll and the upper/lower roll by means of a bevel gear wheel at an angle of 120°.

Solutions which may appear to be logical at first, such as bevel gears or a gear chain, were not taken into consideration for reasons of economy. A new concept was needed!

Eisenbeiss then turned to its many years of experience in conical extruder gear engineering and led the drive shafts in the central gear at an angle of 15° out from the transfer gear box. As a result the working angle of the downstream drive shafts stays in a practicable scale (which does not restrict service life).

Compared to a gear chain, you save more than half the weight and around 40% of the costs. Thanks to the special machines which Eisenbeiss has for conical gear systems, profile corrections are also possible in the longitudinal tooth line, this guarantees optimum gear mesh under load and smooth running. The degree of efficiency compared to bevel gears/gear chains is 25% higher.

In addition to the reduced energy costs, the reduction in losses (power) results in an extended service life of the oil.

This gear concept is made complete by a simple option of adding a switching function. Eisenbeiss also has the necessary experience in this field to realise this even in cases of high output, up to the megawatt level. Numerous references document this in an impressive manner.

**All in all, a special-purpose gear system that really pays off. Choose Eisenbeiss if you are looking for cost-effective solutions.**



Valborg Burgholzer-Kaiser CEO

**Innovations call for courage and a strong basis upon which you can build.**

Being innovative refers not only to technology. The process – from when the order arrives until the gear system and documentation are shipped – can also lead to innovation.

In 2015 we had some unusual delivery challenges which were mainly caused by the implementation of a major upgrade to our IT system.

Challenges of this nature makes you stronger and we can confidently state that as a direct result of several months of internal restructuring our internal workflow processes and adapting them in line with our requirements delivery challenges are now a thin of the past. Delivery punctuality is now our third pillar of strength alongside quality and performance.

**We attach the utmost importance to customer satisfaction.**

# EISENBEISS, THE TRENDSETTER IN THE SPECIAL-PURPOSE GEAR INDUSTRY



## MR BURGHOLZER, YOUR COMPANY HAS POSITIONED ITSELF SUCCESSFULLY AS A SUPPLIER OF SPECIAL-PURPOSE GEAR SYSTEMS FOR A NUMBER OF YEARS. HOW DID THIS COME ABOUT?

When I took over the company Eisenbeiss 25 years ago it was necessary at that time to analyse the market extremely thoroughly in order to make the company profitable again. We discovered the following: the market for **drive technology and gear system engineering** consisted of **approx. 60% standard/series products, 30% customised and 10% special-purpose gear systems.**

## WHAT CONCLUSIONS DID YOU DRAW FROM THESE FINDINGS?

Due to the structure of our company and the differentiation opportunities in the marketplace it was clear that our biggest chances would be in the special-purpose gear segment. Fortunately, this strategy worked out. We are the global market leader for a multitude of special-purpose gears and received the Austrian Innovation Award last year for one of our products.

The decision to become a specialist was incredibly motivating for us and inspired our developers to think about newer and better solutions again and again. You always expect specialists to come up with creative solutions, the latest and the best. This is why

the principle **"Think Innovation"** has become the soul of our company.

## WHAT CHANGES DID YOU HAVE TO MAKE TO THE "OLD" EISENBEISS COMPANY TO GET WHERE YOU ARE TODAY?

The name Eisenbeiss was already known back then beyond Austria's borders with the company supplying large numbers of standard and customised gears to Scandinavia, for example.

Despite these considerable quantities, however, the company was too small to compete with the prices of the really big players in the standard and customised gear segment in the long term. This is why we gave up 70% of the manufacturing programme and concentrated on the remaining 30%.

## WHY DID YOU DECIDE TO MARCH FIRMLY IN THE DIRECTION OF SPECIAL-PURPOSE GEARS AND NOT ONLY DO WITHOUT THE MANUFACTURING OF STANDARD GEARS BUT ALSO THE MANUFACTURING OF CUSTOMISED GEARS?

I have to elaborate a little on this. For standard and customised gear manufacturers it is important to be the cost leader with a multifunctional modular system. The products of the series manufacturer are designed for a wide range of applications, from packing machines, conveyor and transport systems, textile machines and printing machines to the extremely far-reaching use cases in mechanical engineering. As I mentioned, Eisenbeiss was not large enough.

## On the subject of customised gears:

Many manufacturers of customised gears face the dilemma of having to fulfil the special requirements their customers have while keeping the additional costs as low as possible. The cost pressure is enormous because the customised manufacturer does not have the series required to produce in a truly inexpensive way for the market.

The situation for manufacturers of special-purpose gear systems is different. The specialist concentrates on very specific use cases, i.e. on certain fields of application or, to put it differently, on a specific manufacturing programme.

These are of course specific application cases where, for example, a long service life, high operating stability, extreme shock stress or other harmful effects, an extremely high degree of efficiency or maximum energy efficiency, smooth running or reduced noise emissions etc. are extremely important.

## I'M NOT SURE IF I HAVE FULLY UNDERSTOOD THE DIFFERENCE BETWEEN A "MANUFACTURER OF CUSTOMISED GEARS" AND A "MANUFACTURER OF SPECIAL-PURPOSE GEARS". COULD YOU PERHAPS BE A LITTLE MORE PRECISE?

Allow me to compare it with going to see a doctor. The family doctor or general practitioner helps us with lots of illnesses and aches and pains, but in some cases he or she will send us to see a specialist who has more expertise in a certain field. This is similar in our case. As a specialist we not only have to be a master of the craft of gear engineering, we also have to know a lot about the field of application - this is the only way we can design and produce the optimum gear with the customer and for the customer.

## SPECIALISTS ARE ASSOCIATED NOT ONLY WITH BETTER SOLUTIONS AND HIGH QUALITY BUT ALSO HIGH PRICES. HOW DO YOU FEEL ABOUT THIS?

You are right, on the whole, people always jump to this conclusion. However, customers who buy or have bought our products are slowly beginning to think differently.

They think beyond the investment costs of our special-purpose gears and think in terms of the **"life-cycle costs"**, as what appears to be a higher investment more than pays for itself over its life time. Thanks to the high quality, the degree of innovation and long service life of our products, the price of our gear systems in fact works out less expensive than any low-cost bought-in gearbox. We calculate this fact and explain it to all of our customers. At this point I would like to mention our new generation of intelligent gears (**GearControl system**).



**Der Interviewer**  
**Dr. Klaus Nemetz**

Founder and former majority shareholder of the market research institute Spectra Marktforschung in Linz who acquired expert knowledge of the industry over decades.



**The entrepreneur**  
**Gerhard Burgholzer**

Owner of Eisenbeiss GmbH. He took over the company in a very difficult time in 1994 and developed it into the trendsetter in special-purpose gear engineering.

The gears give an immediate signal to a central point if there are any signs of damage, instability, etc. so the item(s) can be replaced in good time. Downtime or other problems which have a negative impact on the production process and cost a lot of money can be avoided as a result. Unforeseeable gear damage has resulted in downtime in the production process time and again. This has cost companies considerable amounts.

**Eisenbeiss is the specialist for industrial gears and offers perfect solutions with the GearControl system. Attractive prices are achieved by downsizing – smaller dimensions with the same performance.**

# DOWNSIZING – IN GEAR ENGINEERING INNOVATIONS WHICH PAY OFF FOR THE CUSTOMER

## COST-EFFECTIVE PRICE THANKS TO SPECIAL-PURPOSE GEAR SYSTEM

**Use case: slab turner for China**

**Challenge:**

No continuous-operation performance gear, however high robustness and rigidity to withstand high-impact external forces.

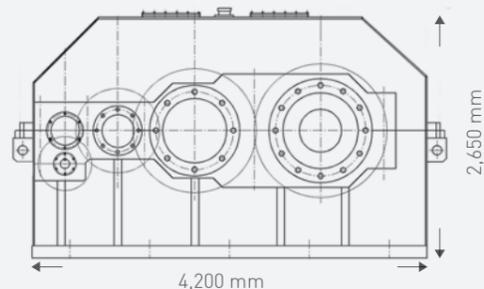
**Performance data:**

P = 200 KW	load rating with Tab (eff.)
nab = 3.35 rpm	SH > 1.6 (pitting)
i = 223.63	SF > 3 (tooth root)
Tab = 570.4 KNm	Lh10 > 40,000 h

**One requirement – two different gears!**

**COMPETITOR**

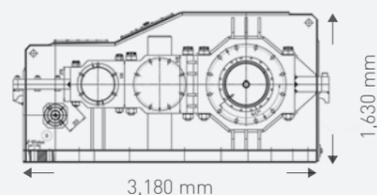
Standard gear



Final stage centre distance: 1,340 mm  
Housing length: 4,200 mm  
Housing height: 2,650 mm  
**Weight: 32,000 kg**

**EISENBEISS**

Special-purpose gear optimised for the specific application

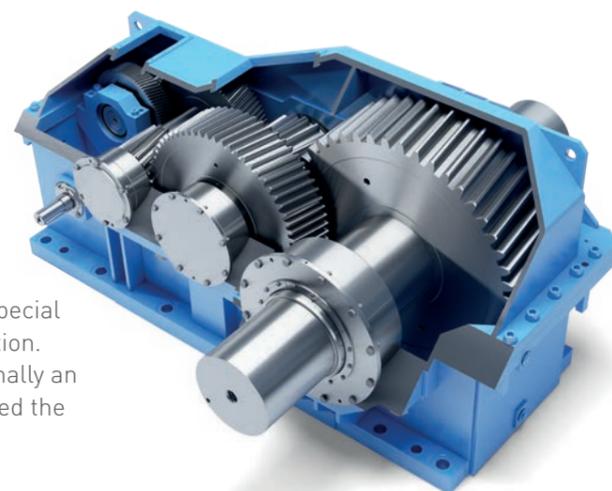


Final stage centre distance: 945 mm  
Housing length: 3,180 mm  
Housing height: 1,630 mm  
**Weight: 23,000 kg**

**SUMMARY:**

**Eisenbeiss gear weight 70% of standard gear, weight saving and therefore resource saving 30%.**

Because of these specific requirements, the advantages of a special solution, compared with a standard transmission, clear to fruition. Despite the additional expenses for the special construction finally an impressive cost reduction of 12-15% remains above, disregarded the resource savings.



## SPECIAL-PURPOSE GEAR WITH NUMEROUS BENEFITS

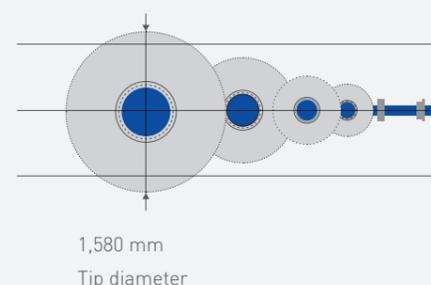
**Use case: ingot pusher VA Grobblech**

**Challenge:**

No continuous-operation performance gear, but major shocks. Output torque Tab = 1,200 KNm Output speed nab = 3.16 rpm

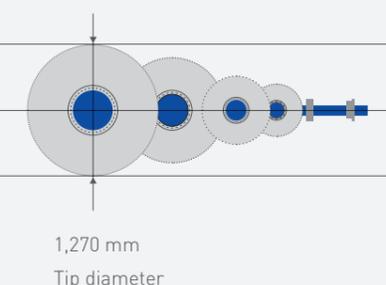
**One requirement – two different gears!**

**COMPETITOR**



The standard gear offered by the competitor requires a tip diameter of 1,580 mm (due to the given tooth system on standard gears)

**EISENBEISS**



Eisenbeiss special-purpose gear systems with optimised tooth geometry for the specific application require a tip diameter of only 1,270 mm

**SUMMARY:**

**Eisenbeiss gear weight 75% of standard gear, weight saving and therefore resource saving 25%.**

**It pays off to ask Eisenbeiss, the specialist.**



Karl Hahn CTO

**Innovations are the soul of our company.**

The examples mentioned in the "News" section are confirmation for you of our innovative strength in the sector of special-purpose gears for the steel and aluminium industry.

We are conscious of the fact that we have to keep pace with the development of our customers in order to fulfil the requirements and expectations of the companies (of the customers – our customers) which operate around the world.

We make every effort to be a valuable partner in drive technology for you – in the new development of systems and processes – in the same way that we have concentrated on offering solutions to increase both performance and productivity in the modernisation of existing systems.

If you have seen our previous news items you have without doubt also noticed that we have been working on the monitoring of drive systems for some years to increase plant productivity through the avoidance and prevention of damage and make the complexity manageable.

# HIGHER PRODUCTIVITY THROUGH i:GEAR 4.0® AT STEELWORKS

**Two intelligent gear solutions were supplied for a rolling mill in the course of the modernisation of a steelworks.** The two roughly 60 tonne heavy gears transmit 7.6 megawatts of drive power with an output torque of 2.2 million Nm.

**The customer relies on an intelligent i:GEAR 4.0® gear to ensure maximum plant availability and minimise the risk of gear damage. This monitors oil status, gear status and gear stress independently.**

## i:GEAR 4.0® THE WORRY- FREE PACKAGE

### OIL LEVEL AND LUBRICATION

i:GEAR 4.0® checks and informs you constantly about the current gear oil and lubrication status. The proven oil level sensor GearControl-OiL® and conventional pressure, temperature and flowrate sensors are used here. Unfavourable operating statuses such as advanced oil aging or inadequate lubrication are identified reliably and damage can be avoided actively as result.

### GEAR STATUS

The condition of the bearings and tooth parts is registered using vibration sensors. In combination with the speed measurement, an order analysis of the damage frequency is carried out and

its development evaluated continuously. This means that any emerging damage can be identified in good time. Maintenance measures can be integrated in existing downtime cycles and costly consequential damage can be avoided.

### VISUALISATION

The relevant operating data are shown at the customer's production control system together with other data from the drive train. GearControl was integrated in the existing control station via PROFIBUS. Additionally the customer has access to current and stored measuring data in the form of graphically prepared trends via the GearControl Webinterface. Possible warnings and alarms are assigned directly with colour coding to the components concerned on the display in an interactive block diagram.

### YOUR BENEFIT

i:GEAR 4.0® makes control easier, saves resources and thus creates the potential to spend more time on core tasks, i.e. optimising production processes. Another advantage, the remote access which is installed, rounds off the worry-free gear package.

At the customer's request the Eisenbeiss GearControl support team can connect directly to the status monitoring system and offer the customer advice and action without delay.



Interactive block diagram of the Webinterface

## NEXT ISSUE

- Innovations which reduce investment costs
- The manufacturing philosophy of Eisenbeiss

- Planning processes at Eisenbeiss
- Certificates for lasting and satisfying use cases

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SETTING STANDARDS IN GEARING TECHNOLOGY  
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