

# LARGE-DIAMETER ROLLING BEARINGS, GEAR RIMS AND PIVOT JOINTS, FORGED AND SEGMENTED IN XXL SIZE

READY TO INSTALL

## Your professional partner for the entire process chain

What makes our steel mill stand out is our ability to execute the entire process chain in-house – from the provision of forging ingots to the delivery of ready-to-install products. Besides our 10 MN free-form forging press, the corresponding furnaces and heat treatment systems, our production facilities also include large dimension CNC machines as well as comprehensive testing technology. After the machining, the segments are combined with the necessary accessories to form a ready-to-install kit, and delivered to the client in accordance with the agreed schedule.

## Growing demands

Due to the enormous forces which apply there, the rolling bearings and gear rims in pivot joints of large machinery are the components under the highest load. In addition to that, the operating conditions are often harsh and extremely “hostile” to mechanical parts: dust, dirt and moisture, as well as cold or heat. This is why the quality and durability of these key components is essential.

In order to ensure maximum availability of the machinery, we try to not only minimise the risk of failure, but also keep maintenance intervals as long as possible and keep downtime for maintenance to a minimum.

## Complete and ready-to-install components from a single source

The recent boom on the commodity markets and the ever-increasing global flows of goods have in turn led to higher demands with regard to machines and production plants. Some of the most prominent examples of such large machinery are the huge bucket-wheel excavators in German coal fields, as well as container loaders, loading cranes or cement furnaces.

## Kit accessories

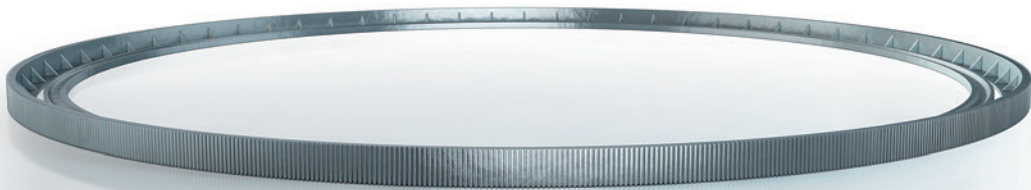
- balls, spacers and links
- sealings and hooks
- oil collecting troughs
- other small parts

# FORGED ROLLING BEARINGS AND GEAR RIMS

## A competitive edge with forging

The advantages of using forged bearing and gear rim segments are obvious: Even large components can be formed hot, and customised parts can be produced economically in small batches. Delivery times are generally shorter than for castings, as no special tools or moulds have to be manufactured. The fact that the forged contour is closer to the finished form saves

material and costs when machining segments later on. Furthermore, our forging steels are highly suitable for surface hardening methods such as induction hardening. This method gives the tread area an increased resistance to wear, in addition to the basic material strength.



## Limiting system costs at the development stage

A large variety of materials is available for forging. In addition to our standard steel grades 42CrMo4, 34CrNiMo6, 50CrV4 and CK45, many other special grades can be used for forged segments at Stahlwerk Augustfehn. Benefitting from the outstanding material properties of forgings throughout the

development process, components become more compact and are therefore significantly easier to build. This is why forging is often the more cost-effective alternative, when taking all aspects into consideration.

## Your professional partner

Thanks to our extensive expertise and know-how in this area, we are able to offer forged large-diameter rolling bearings and gear rims, manufactured in segments ready-to-install. Our services include analysis of the perfect material, forging and heat treatment, quality testing as well as high-performance CNC machining. In our production programme, we manufacture segments with a final diameter of 4 to 30m.

## SINGLE-SOURCE PROCESSING

Turbomech GmbH & Co. KG is our associate processing company, with whom we are working in a close and highly efficient partnership. For further information please visit [www.turbomech.de](http://www.turbomech.de)

*Many machines in mining, port handling or similar facilities have pivot joints with large dimension anti-friction bearings and gear rims. Forging has proven to be an ideal solution for these key components under continuously heavy loads.*

*Stahlwerk Augustfehn Schmiede GmbH & Co. KG specialises in manufacturing ready-to-install rolling bearings and gear rims with a diameter of 4 to 30 m, which are precision-forged in segments.*

### Provider of high-quality forging

Stahlwerk Augustfehn works in this highly competitive market as a provider of large dimension and ready-to-install bearings and gear rims, manufactured in segments.

While other manufacturers often use casting or cold-rolling to produce such components, we traditionally opt for the renowned quality benefits of forging.

Due to the hot-forming process and subsequent heat treatment, forgings have a very dense, fine-grained

microstructure, and the fibre orientation in the load direction gives the components additional resistance and dimensional stability.

With the right experience and know-how, we are able to forge the shapes close to the desired finished contour, which saves money and processing time later at the cutting stage.

Based on our longstanding experience, we have developed highly specialised guidelines for the analysis of raw materials, in order to prolong the lifetimes of our rolling bearings and gear rims. In addition to

that, we also offer combined forged/ welded components, where bar and gear rim parts are forged separately, and then welded together.

The next step is the machining with our high-performance CNC equipment, to create the finished tread area or gear rim segment from the original blank. We produce segments for rolling bearings and gear rims with a final diameter of 4 to 30 m.

Our standard steel grades are 42CrMo4, 34CrNiMo6, 50CrV4 and Ck 45; however, other material grades can be used for forging on request. In addition to that, tread

areas can be surface-hardened to increase resistance to wear.



# FORGED ROLLING BEARINGS AND GEAR RIMS

## Examples of Use

- large-diameter forged rolling bearings
- forged gear rims
- fully forged pivot joints
- all products also available in "XXL" size

## Sophisticated forging solutions

With its forged large-diameter bearings and gear rims, Stahlwerk Augustfehn offers the right solutions for today's demanding markets. Our free-forged segmented parts guarantee long lifetimes even under the extreme dynamic loads in the operation of heavy machinery. Forged components guarantee an added benefit with regard to material microstructure.

With cast steel parts, there is always a certain danger to product safety and stability due to pore formation and the physical conditions of solidification.

Forging avoids this risk, as the forming process creates a fine-grained and regular microstructure.

The forging process improves mechanical properties and thus lays the foundation for ideal material strength and toughness, which will be fine-tuned during the subsequent heat treatment stage. The process gives the forgings a very dense and fine-grained structure, and as the fibre orientation is the same as the load direction, resistance and dimensional stability are improved further.

## Component safety and operational stability are key

Rolling bearings and gear rims in large machinery are subjected to extreme loads. These are the components where the strongest forces apply, in addition to often harsh operating conditions: Dust, dirt and moisture are everywhere, exacerbated by cold or heat, depending on the location.

It goes without saying that large-diameter bearings and gear rims have to fulfil highest standards with regard to quality and durability. As the components are constantly in use, the risk of failure has to be minimised. Ideally, maintenance intervals should be long, and the required downtime for maintenance work should be as short as possible.