

# CLAMPING AND GRIPPING TECHNOLOGY FOR RAIL VEHICLE COMPONENTS

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# FIRM GRIP FOR FLAWLESS ROLLING PERFORMANCE

# RÖHM

For more than 110 years, RÖHM has been producing clamping, gripping, and handling technology. Many of the world's leading machine and plant manufacturers rely on us as their standard supplier for lathe chucks, power chucks, collet chucks, mandrels, live centers, and steady rests, as well as for robotic gripping technology. Our products are known for their exceptional combination of robustness, precision as well as intelligent force and motion control. This is why RÖHM has also been a trusted partner to the Rolling Stock industry for many years.



*RÖHM provides clamping and gripping solutions for machining components across all types of rail vehicles*

## ENGINEERED SOLUTIONS FOR CLAMPING LARGE, HEAVY COMPONENTS

RÖHM provides advanced clamping and gripping technology for machining components used in rail vehicles. This includes wheels and axles, as well as brake and buffer systems. These parts are often extremely large and heavy, with diameters and lengths exceeding one meter and weights reaching several hundred kilograms. Handling such components is inherently challenging – but the real complexity lies in meeting the high precision and surface quality standards required for wheelset parts.



## OPTIMIZING RIDE SMOOTHNESS AND OPERATIONAL RELIABILITY

Precision That Drives Performance. Smooth operation is essential – especially as rail vehicle speeds increase. At the same time, machining defects such as grooves or notches must be avoided, as they can become initiation points for cracks and potential failure during service. Clamping and gripping technology plays a critical role in ensuring machining meets these demanding standards. Holding large, heavy workpieces with high force and precision – without causing damage – requires true engineering expertise. In many cases, a custom solution is necessary. RÖHM delivers both.

## RECONDITIONING: THE GREATEST CHALLENGE

To maintain optimal ride comfort and operational safety, wheelsets require regular maintenance – most critically through precision re-machining of the entire assembly. This process places exceptionally high demands on clamping and gripping systems. Wheelsets are complex workpieces with intricate geometries and challenging interference contours, particularly on critical surfaces such as the running tread and wheel flanges. Compounding the challenge, these components often exhibit damage that resists conventional machining – such as hardened flat spots from braking or embedded debris. During turning operations, such irregularities can generate sudden, high-impact loads. As a result, the clamping and gripping technology must deliver uncompromising stability, resilience, and precision. RÖHM offers robust, high-performance solutions specifically engineered for the re-machining of complete wheelsets – ensuring reliability and accuracy throughout the maintenance cycle.



# FOR THE MANUFACTURING OF WHEELS, AXLES, AND BRAKE DISCS

Wheels and axles are robust forged steel components that undergo a demanding machining process. During rough machining, the scale layer must be efficiently removed with high cutting performance to achieve the raw dimensions. This is followed by precision finish machining, where maximum accuracy is essential.

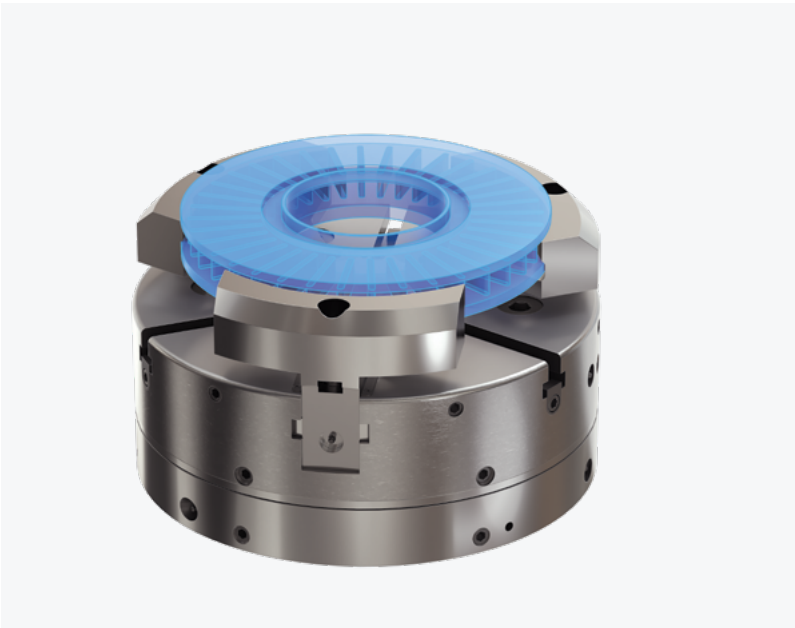
Brake discs are manufactured from special cast iron designed to resist wear and extreme heat – making them particularly challenging to machine. Many feature a complex sandwich structure with internal cavities, adding to the difficulty. In these cases, clamping and gripping technology must deliver both high power and delicate precision to ensure safe and accurate handling.

## AXLE

**TASK:**  
Clamping for complete turning operations, including clamping diameter

**SOLUTION:**  
Combination of two hydraulically actuated lever chucks KKHFR and a self-centering steady rest

- FEATURES:**
- Chuck diameter: 400 mm
  - Clamping range (workpiece diameter): 85 mm to 200 mm
  - Equipped with retractable clamping levers, retraction stroke: 84 mm
  - Manually adjustable between concentric and compensating clamping
  - Total clamping force: 140 kN



## BRAKE DISC

**TASK:**  
Clamping for turning operations

**SOLUTION:**  
Hydraulically actuated angular lever chuck KFG with large jaw stroke and pitch adjustment of the top jaws

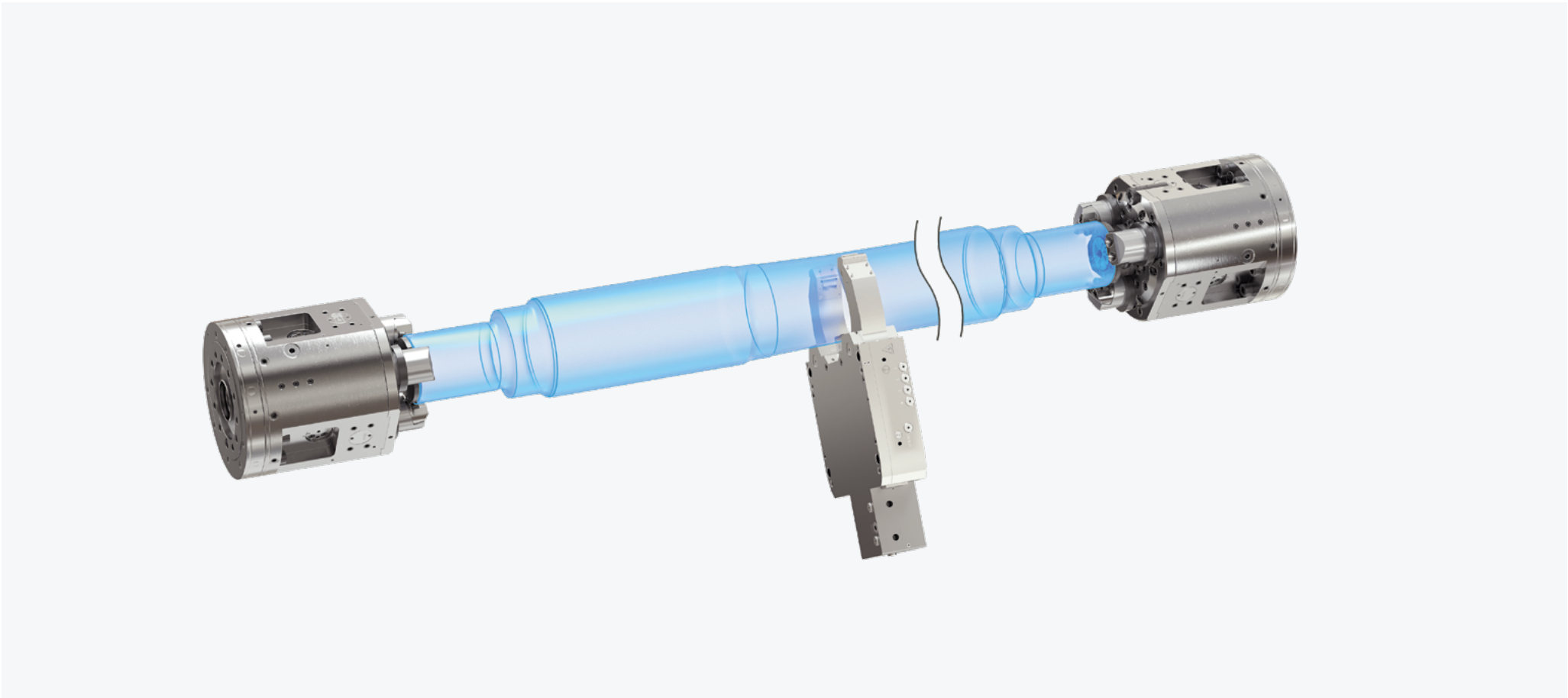
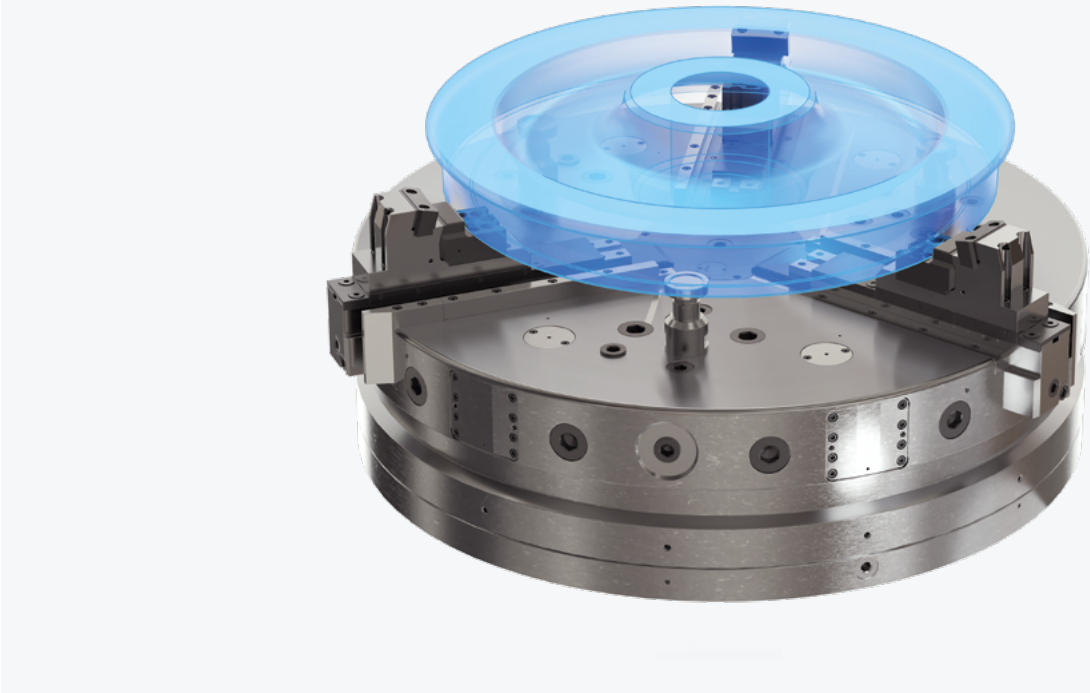
- FEATURES:**
- Chuck diameter: 800 mm
  - Centrifugal force compensation to maintain clamping force at high speeds
  - Total clamping force: 190 kN
  - Pitch adjustment of the top jaws with fine serration

## WHEEL

**TASK:**  
Clamping for turning in the first and/or second setup

**SOLUTION:**  
Three-jaw angular lever chuck with high clamping force

- FEATURES:**
- Chuck diameters from 1,250 mm to 1,600 mm
  - Large jaw stroke and 16 mm pitch adjustment of the top jaws
  - Centrifugal force compensation to maintain clamping force at high speeds
  - Manual concentricity and jaw fine adjustment
  - Pneumatic system control for verifying correct workpiece positioning



## FOR THE MAINTENANCE OF WHEELSETS

RÖHM supplies primary manufacturers and operators of portal wheelset machines for above-floor re-machining of complete wheelsets. Just like the machines themselves, the clamping and gripping technology must be extremely strong and robust to securely hold these large and heavy workpieces. In addition, it must be capable of tolerating and compensating for the imbalances and impacts that inevitably occur during the reconditioning of worn wheelsets—particularly during turning and grinding operations.

### WHEELSET, COMPLETE

#### TASK:

Clamping for reprofiling of wheels and brake discs

#### SOLUTION:

Force-actuated compensating chuck with fixed center on the opposite side

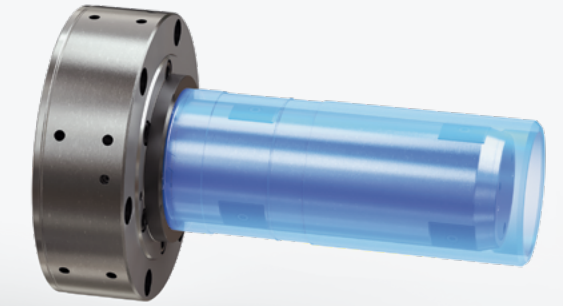
#### FEATURES:

- Chuck diameter: 315 mm, particularly rigid design
- Compensation of shocks and asymmetries via radially floating clamping piston
- Wedge-hook system and 90° serration of the clamping jaws for high stability and clamping accuracy
- Workpiece centering through a specifically adapted flange
- Piston lubrication during concentric clamping
- Low-maintenance operation thanks to special sealing against dirt and chips

## FOR THE MACHINING OF BUFFER COMPONENTS

RÖHM provides clamping and gripping technology for the machining of railway buffer components—regardless of their design. The outer parts of the buffer system are particularly demanding. These are often heavy cast, forged, or pressed components, usually made of high-strength steel. Especially during the initial machining phase, when the scale layer must be removed from these workpieces with high cutting performance, robust machines are required.

The same applies to the clamping and gripping technology: it must be extremely stable and offer high holding force. In addition, its geometry should adapt to the hollow shape of the workpieces and be capable of compensating for manufacturing-related asymmetries.



### BUFFER HOUSING

#### TASK:

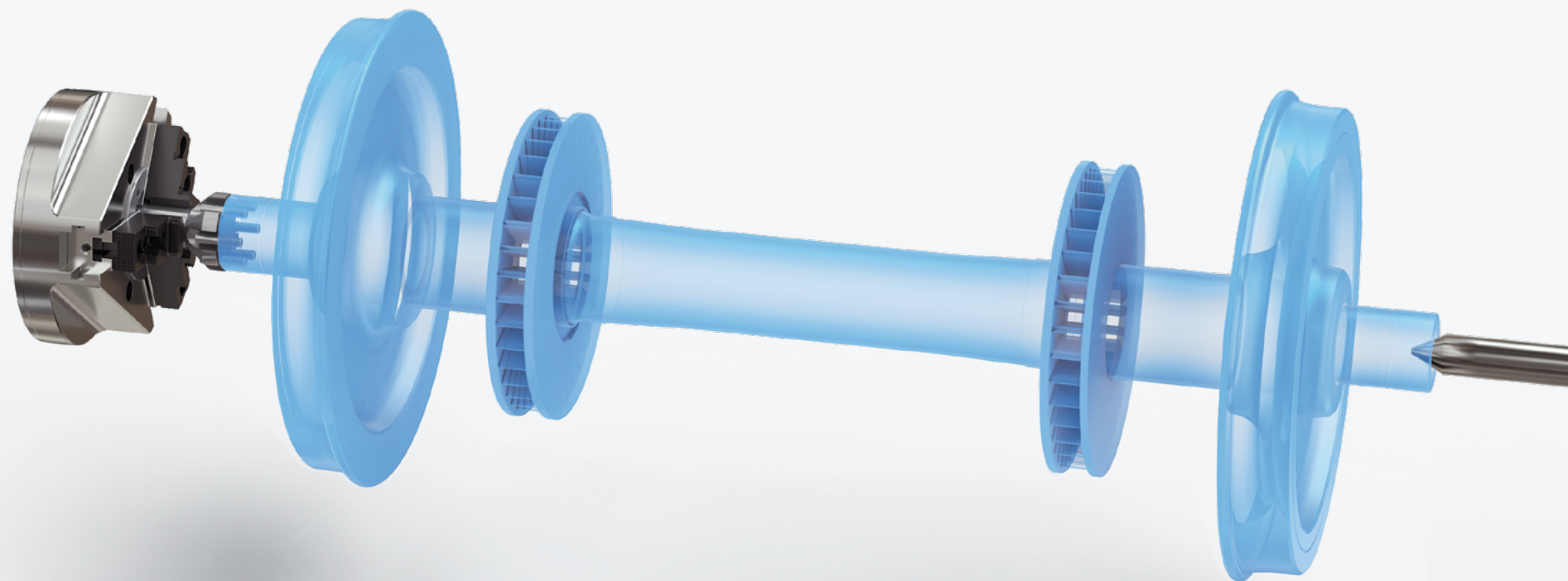
Internal clamping for machining the outer contour

#### SOLUTION:

Force-actuated sliding clamping mandrel KFG

#### FEATURES:

- Two independent clamping planes to compensate for diameter variations
- Interchangeable sliding clamping jaws to accommodate different workpieces and allow replacement after wear
- Serrated sliding clamping jaws for improved torque transmission



# LEVERAGE THE RÖHM MODULAR SYSTEM

For recurring clamping and gripping operations, RÖHM delivers customized configurations built from a range of compatible, standardized components. These solutions are backed by decades of hands-on expertise in the rail vehicle industry, ensuring reliable performance and precision in demanding maintenance environments.

RÖHM's modular systems seamlessly integrate industry-specific requirements with the efficiency and cost-effectiveness of standardized production. Among the most

sought-after components are specially engineered power chucks in various designs, with diameters ranging from 1,350 mm to 1,600 mm.

But size alone isn't the challenge. Clamping large, heavy workpieces demands exceptionally high clamping forces – making the performance of the entire system critical. As one of the few manufacturers offering complete solutions, RÖHM provides not only true power chucks but also precisely matched hydraulic cylinders, available in both solid and hollow configurations.

For machining raw parts that are initially off-center, RÖHM's manually operated independent chucks offer an ideal solution. These allow for individual adjustment of each clamping jaw, ensuring secure and accurate positioning throughout the process.



*Example series products (from left to right): KFD power chuck, OVS solid hydraulic cylinder, USE independent chuck*



## USA

Roehm Products of America Inc.  
2500 Northlake Drive  
Suwanee GA 30024  
Tel +1 770 963 8440  
Fax +1 770 963 8407  
sales@rohm-products.com  
www.rohm-products.com

## UK

ROHM (Great Britain) LTD.  
27 Webb Ellis Business Park,  
Woodside Park,  
Rugby, CV21 2NP  
TEL +44 17 88 22 84 69  
rohmgb@roehm.biz  
www.roehm.biz/en

## GERMANY

RÖHM GmbH  
Heinrich-Roehm-Straße 50  
89567 Sontheim/Brenz  
Deutschland  
TEL +49 7325 16 400  
sales@roehm.biz  
service@roehm.biz



roehm.biz