

TAKRAF[®]



FABRICATION AND TECHNICAL SERVICES

Quality - made in Germany

Innovation out of tradition – It pays to talk to a specialist!

PRODUCTS AND SERVICES

Mining Systems and Equipment

- Complete Mining Systems
- Bucket Wheel Excavators
- Bucket Chain Excavators
- Crushing Plants
- Apron Feeders
- Belt Conveyors
- Belt Feeders
- Belt Wagons
- Mobile Conveyor Bridges
- Spreaders
- Transport Crawlers
- Cable Reel Cars
- Shifting Heads

Minerals Processing Equipment

- Roll Crushers
- Sizers
- High Pressure Grinding Rolls (HPGR)
- DELKOR Thickeners
- DELKOR Horizontal Vacuum Belt Filters
- DELKOR F.A.S.T. Filter Press
- DELKOR BQR Flotation Cells
- DELKOR Belt Linear Screens
- DELKOR Apic Jigs

Bulk Material Handling Systems and Equipment

- Stockyard and Disposal Facilities
- Reclaimers
- Scrapers
- Stackers
- Combined Stacker/Reclaimers
- Wagon unloading
- Wagon/truck loading
- Belt Conveyors
- Tube/Pipe Conveyors
- Ship Loaders
- Ship Unloaders

Services and Components

- Project Development Services
- Fabrication and Components
- Construction and Commissioning
- Technical Services and Spare Parts



TAKRAF Group, through its established and well-known brands, TAKRAF and DELKOR, provides innovative technological solutions to the mining and associated industries. We leverage our experience, acquired over more than a century, to provide equipment, systems and services that best satisfy our clients' mining, comminution, material handling, liquid/solid separation and beneficiation requirements. Owners and operators around the world trust our engineered solutions to lower the total cost of ownership and reduce environmental impact by improving efficiency with safe and reliable equipment. For sustainable solutions backed by expert service you can rely on TAKRAF Group. Visit us at www.takraf.com.

We at TAKRAF Group are committed to environmental and social sustainability in all our business interactions and have adopted a Zero Harm approach under our global safety promise.

Owners and operators around the world are confident that TAKRAF Group provides the most suitable solution to their unique project requirements. We assist our clients in overcoming the most complicated challenges in transforming the resource industry towards a sustainable future. We focus on specific areas that are critical for reliable and sustainable operations, as it is here where we best support our clients with innovative solutions that save energy, lower environmental impact and meet or exceed operational requirements.

We are recognized as the world's leading technology provider when it comes to run-of-mine and bulk material handling. Our TAKRAF brand portfolio ranges from overburden removal, to raw material extraction, comminution, conveying, loading/unloading, processing, homogenizing, blending, storage and final loading for onward shipment.

We leverage our global organization and aggregate our extensive expertise by offering a unique combination of both application experience and product based knowledge. Clients therefore benefit from direct technical discussions with our local specialists, who are able to draw upon this expertise and provide the most suitable local solution and service that enhances safety, improves sustainability, decreases costs and increases efficiency.

Our commitment is summarized by:

S a f e t y | R e l i a b i l i t y | I n n o v a t i o n | S u s t a i n a b i l i t y



FABRICATION

TAKRAF operates a workshop in Lauchhammer/ Germany for the production of huge-size, high-value mechanical components, offering engineering, manufacturing and after-sales services from one single location. Lauchhammer is situated 120 km south of Berlin and 60 km north of Dresden.

The highly skilled employees are specialized in precise machining and component assembly and testing.

The integrated management system is certified according to ISO 9001, ISO 14001, BS OHSAS 18001, SCCP and EN 1090.

All essential manufacturing steps can be carried out in four interconnected bays with a total covered production area of 17,900 m². Crane capacity allows the handling of units weighing up to 130 tons.

Finished products are dispatched either by truck or train. The roads from the workshop to the nearby Autobahn are fully developed for heavy load and oversize truck transport.

In-house fabrication provides a perfect training ground for engineers, inspection and supervising personnel.

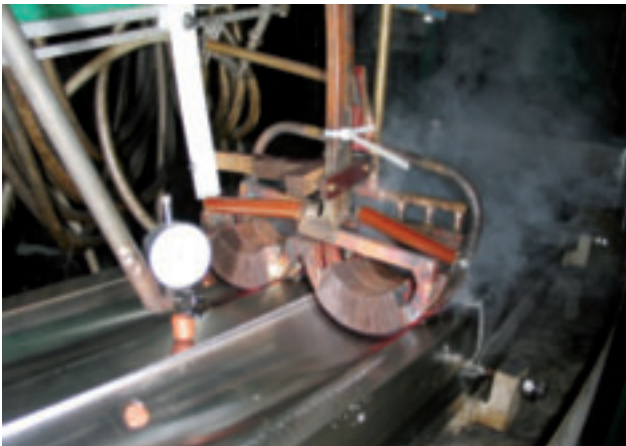




WORKSHOP EQUIPMENT

State-of-the-art tools & machinery

- Turning center: max. diameter 2,000 mm, max. length 10,000 mm
- Vertical lathe: max. diameter 6,300 mm, max. height 4,000 mm
- Boring and milling:
up to 7 controllable axes
longitudinal travel max. 18,000 mm
vertical travel max. 4,000 mm
turntable 3,000 x 3,500 mm



Prefabrication

- Huge press with 1,000 tons capacity
- Roll bending of plates with up to 80 mm thickness
- Planing machine 2,000 x 6,000 x 1,800 mm



WORKSHOP EQUIPMENT

Certified welding procedures

- SMW – submerged manual welding
- SAW – submerged arc welding
- FCAW – flux core arc welding
- Tungsten inert gas welding

Furnace for heat treatment of complex structural parts
4,500 x 3,000 x 2,500 mm

Inductive hardening device for increased wear resistance

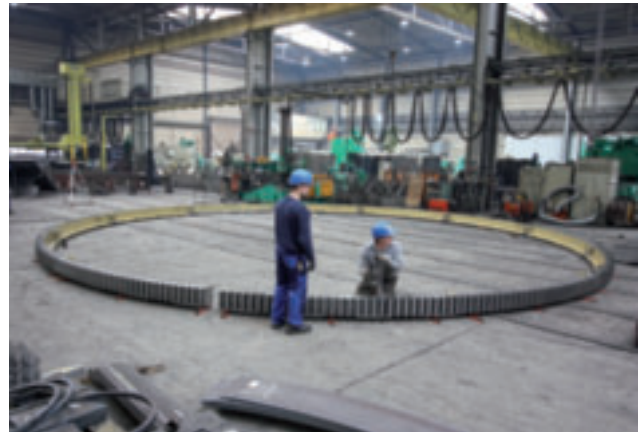
State-of-the-art shot blasting and painting facilities



WORKSHOP

Product range

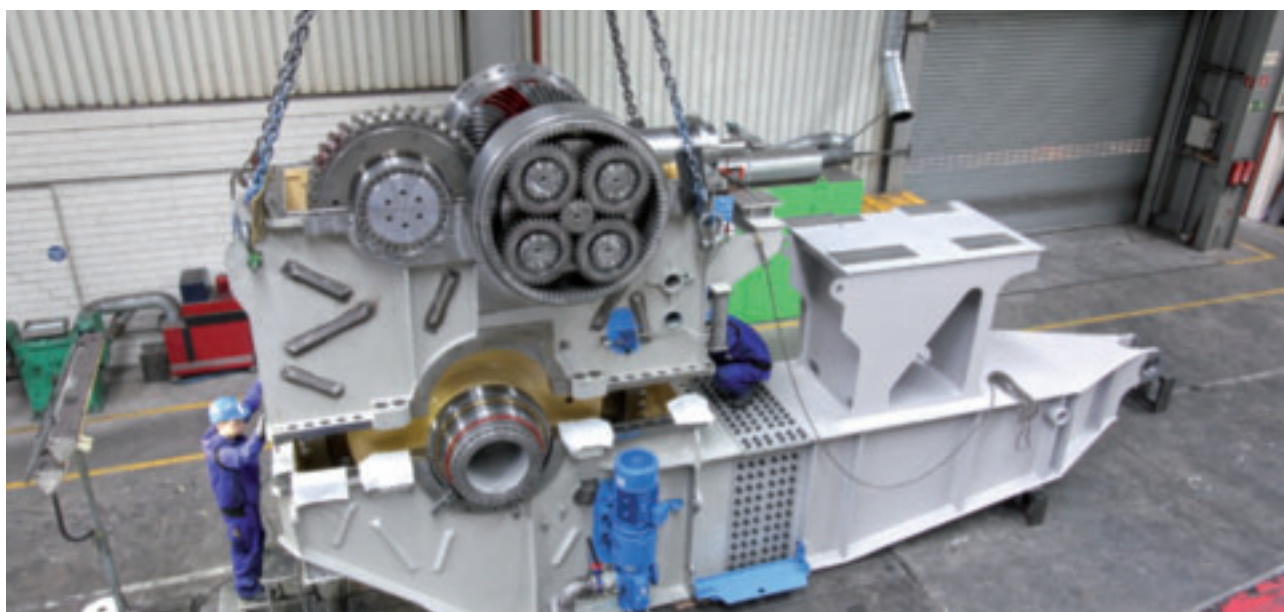
- Engineered belt pulleys
- Take-up winches
- Rope drums and rope sheaves
- Bucket wheels
- Crawler assemblies
- Large gearboxes



WORKSHOP

Product range

- Large segmented ball bearings and gear rims
- Large pivot bearings





WORKSHOP

Product range

- Apron feeders
- Sizers
- Jib cranes
- Transport crawlers
- Surface miners
- OEM spare parts

Requests for quotation for these and other similar mechanical equipment are welcome.



WORKSHOP

Assembly and Testing

The Lauchhammer workshop is perfectly suited to either preassemble functional units or complete machines. Individually designed tests before shipment increase quality and facilitate later commissioning at the site of operation.

- Mechanical assembly
- Electrical installation
- Hydraulic and pneumatic installation
- Piping



In-house testing facilities:

- Multi-day gearbox load tests up to 800 KW
- Indoor functional tests of electro-hydraulic and diesel-hydraulic drive trains
- Load test for jib cranes
- Spacious multi-purpose outdoor test field (digging tests, test drives)

Assembly and testing is supported by extensive measuring instruments and analyzers:

- Endoscopy
- Noise and vibration analyzers
- Bearing analyzers
- Laser adjustment devices
- In-line torque meters



QUALITY ASSURANCE

TAKRAF's quality assurance is carried out in accordance with ISO 9001 along the entire value chain.

- Highly qualified and worldwide experienced inspection personnel
- Certified and proven quality procedures
- State-of-the-art test equipment (non-destructive material testing, 3D-laser tracker, roughness testing, hardness testing)
- Consistent test and inspection planning for in-house and subcontracted manufacturing
- Independent in-process quality monitoring
- Continuous inspection at sub-contractors





TECHNICAL SERVICES

Installation and Commissioning

TAKRAF provides a wide range of services to manage and support installation and commissioning.

- Site management
- Scheduling
- Installation procedures planning
- Supervision and inspection
- Specialized fitters and welders
- Training

Our installation experts gained their experience at sites all over the world, and under all climatic conditions.

The involvement of our experts may be limited to site supervision, but it can also be extended to turn-key handover.



TECHNICAL SERVICES

Inspections and Maintenance

Long-term availability requires appropriate maintenance. TAKRAF's service team is committed to provide all necessary support.

- Regular inspection of safety devices including readjustment if necessary
- Regular inspections of main steel structures in accordance with international codes and local regulations
- Inspection reports propose necessary actions considering priorities and urgency
- Spare and wear part proposals considering specific operating conditions
- OEM spare part supply
- Training
- Engineering and site assistance for troubleshooting and major repairs
- Gearbox service, comprising condition monitoring by regular inspections, on-site repair, in-house reconditioning



TECHNICAL SERVICES

Refurbishment and Upgrading

After years of operation under tough conditions progressive wear and decreasing availability may trigger plans to purchase new equipment. However, in certain cases carefully targeted refurbishment can be an attractive alternative.

Thorough inspections allow for a comprehensive proposal considering actual wear and fatigue. According to the priorities set by the client and the available budget, a detailed refurbishment project can be proposed including a reasonable work split-up between the client, local maintenance companies and TAKRAF.

If operating or geological conditions have changed significantly, TAKRAF also offers to increase the performance or to extend operating parameters of existing equipment.

As TAKRAF has contributed to more than 50 major refurbishment and modernization projects worldwide,

interested parties are invited to visit reference projects and discuss the potential of modernization in detail.



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