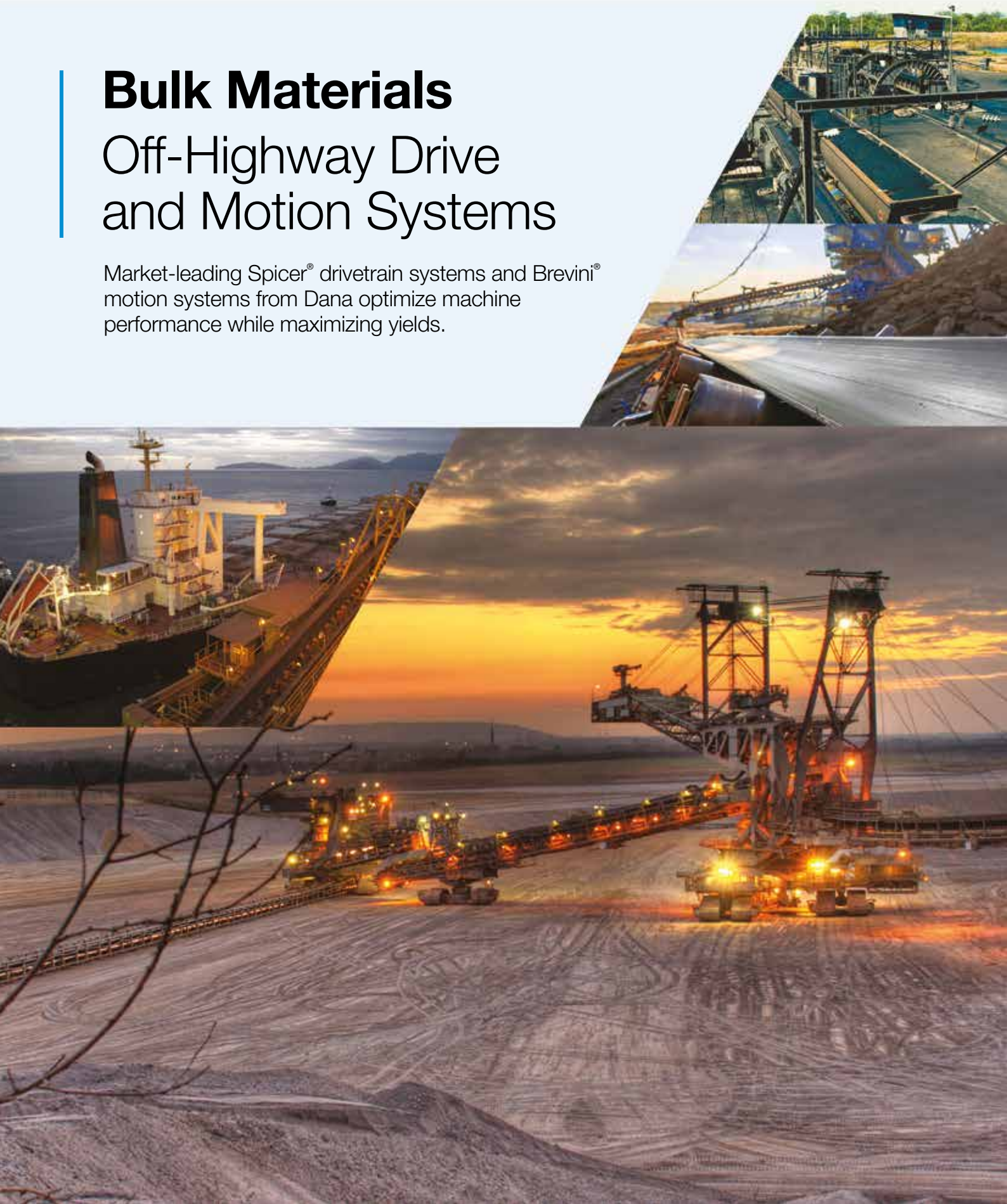




# Bulk Materials

## Off-Highway Drive and Motion Systems

Market-leading Spicer® drivetrain systems and Brevini® motion systems from Dana optimize machine performance while maximizing yields.







# People Finding A Better Way<sup>®</sup>

Established in **1904**. Employing **38,000** people across **141** major facilities in **33** countries. Shipping to **14,000** customers in **141** countries. Leveraging a global network of technology centers across **9** countries.

### Vision

To be the global technology leader in efficient power conveyance and energy-management solutions that enable our customers to achieve their sustainability objectives.

### Mission

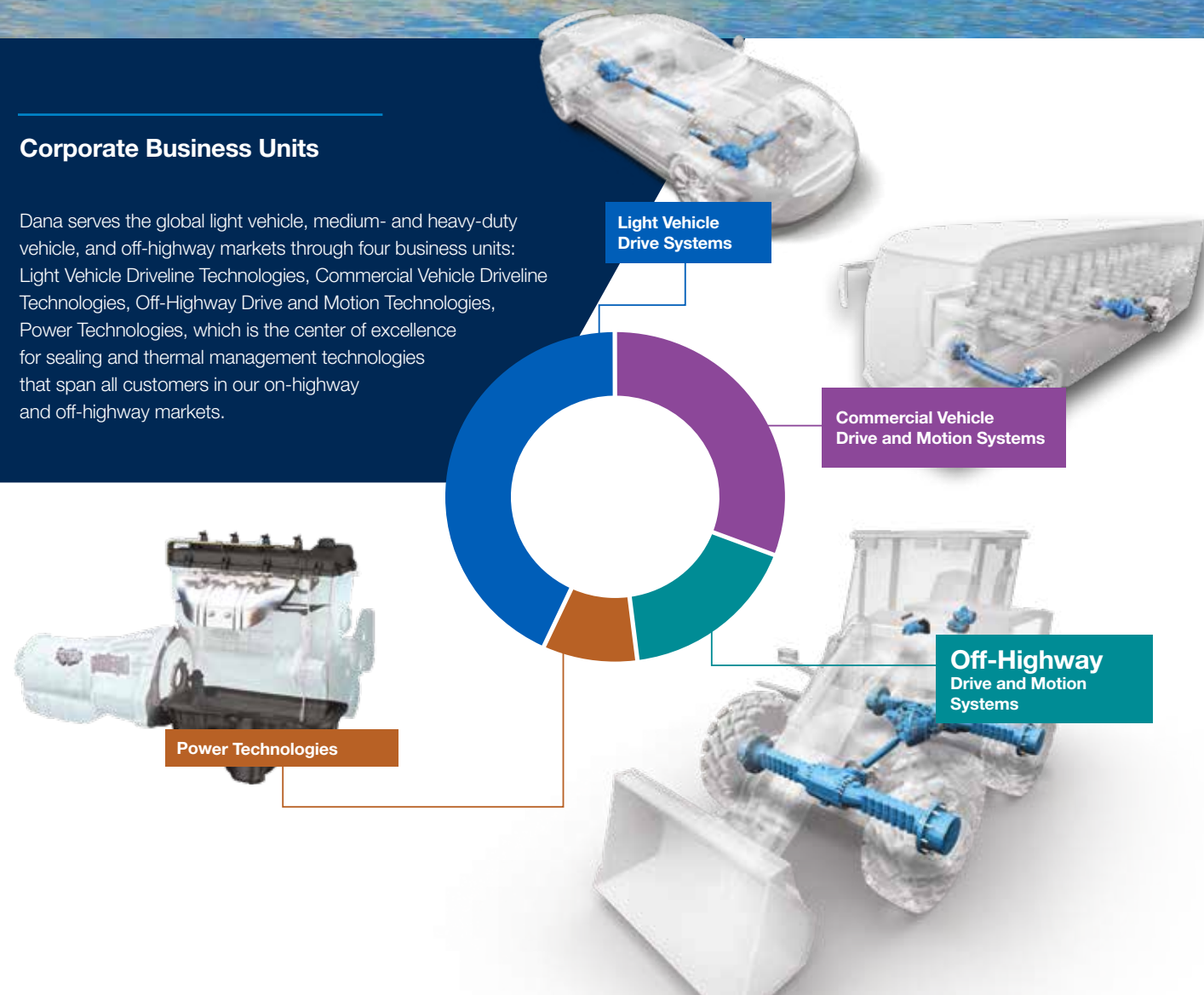
Our talented people power a customer-centric organization that is continuously improving the performance and efficiency of vehicles and machines around the globe. We will consistently deliver superior products and services to our customers and will generate exceptional value for our shareholders.

### Values

- Honesty and Integrity
- Good Corporate Citizenship
- Open Communication
- Continuous Improvement

### Corporate Business Units

Dana serves the global light vehicle, medium- and heavy-duty vehicle, and off-highway markets through four business units: Light Vehicle Driveline Technologies, Commercial Vehicle Driveline Technologies, Off-Highway Drive and Motion Technologies, Power Technologies, which is the center of excellence for sealing and thermal management technologies that span all customers in our on-highway and off-highway markets.



## Where there is a need, Dana finds a better way.

### A new era of mobility is upon us.

Emissions regulations and government policies are manifesting at an ever-increasing pace, and visions of vehicles that reduce operating costs while enhancing productivity and safety are accelerating the need for alternative propulsion solutions.

For over 20 years, our group of highly focused engineers has been dedicated to research and development of new technology solutions aimed at electrification.

We have built a broad portfolio of award-winning, patented technologies, making us a leader in electrification.

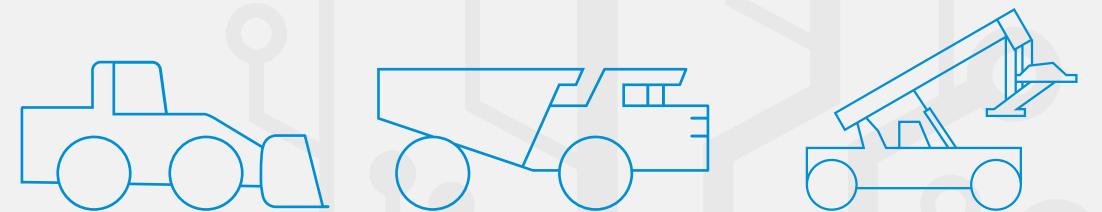
## Why should you rely on Dana?

### Solutions designed, engineered, and manufactured for maximum efficiency.

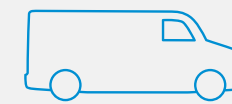
We approach electrification with a trained eye and an insightful, innovative perspective, utilizing market synergies to provide an advantage in electrifying offerings across multiple applications.

A component is only as good as the system in which it operates. That's why we take a systems-focused approach, seamlessly integrating our components into complete electrified systems.

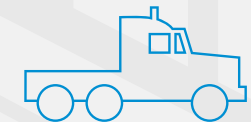
We have an in-house, multi-disciplinary team of system solutions engineers who provide turnkey software and controls for our entire portfolio of technologies. This in-house knowledge and integration produces solutions that provide enhanced performance, packaging optimization, and reduced system weight. All of which results in savings to your bottom line.



OFF-HIGHWAY VEHICLES



LIGHT VEHICLE



COMMERCIAL VEHICLE



**WEIGHT REDUCTION**  
For additional payload or battery capacity



**EFFICIENCY**  
Reduced energy consumption means increased range and cost savings



**PACKAGING**  
Improved vehicle integration for optimized packaging space



**COOLING SOLUTIONS**  
Capability to integrate thermal-management solutions with power sources



# Off-Highway Segments

Dana leverages our global expertise to engineer the most advanced, customized product solutions for developed and emerging markets. Our drive and motion products serve a wide range of demanding industries, including applications for equipment with wheel and track drives as well as stationary machines.

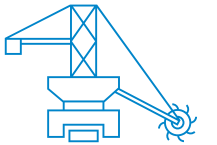


## Industrial



### Bulk Materials

Dana has an extensive range of gearboxes with torque ratings of up to 3 million Nm. Our qualified, experienced engineers provide optimum solutions for heavy-duty applications, and our service team delivers support for the entire life cycle after delivery.



### Heavy Industry and Steel

Brevini™ gearboxes have been used in heavy-duty operations from mines to steel production for more than 50 years. Our portfolio of advanced technologies has been engineered to support increased productivity and reliability, improved operator safety, and reduced total cost of ownership.



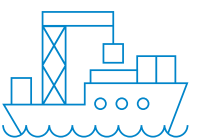
### Industrial and Stationary Equipment

Our range of gearboxes and hydraulic products offers reliable solutions for all equipment within the industrial and stationary sectors. Our products enable high productivity and low maintenance costs backed by our aftermarket support and service.



### Marine

Brevini™ planetary gearboxes have supported the exacting specifications and certifications of winches and cranes in the marine and offshore market for many years. We also offer a wide range of fluid power solutions that deliver safe and reliable solutions for OEM applications.



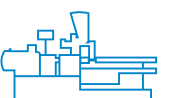
### Environment - Renewable Energy

Brevini™ gearboxes for yaw and pitch drives are used by many of the major wind turbine OEMs. We provide engineering input offering sustainable and reliable solutions to meet customer requirements, while our service division has extensive experience in optimizing the performance of gearboxes over the long term.



### Plastic and Rubber

Brevini™ and PIV™ brand products include single- and twin-screw extruder drives, rack and pinion drives, rack and pinion drives for injection molding machines, planetary gearboxes, and helical and bevel helical gearboxes.



## Mobile



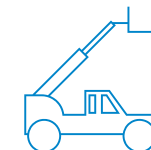
### Agriculture

Our products are engineered to support increased crop yields, optimized harvesting operations, lower emissions, improved operator safety and comfort, and reduced total cost of ownership while complying with evolving emissions standards.



### Material Handling

Our customized drive and motion systems enhance material-handling vehicle performance, productivity, and power. Spicer® transmissions, axles, and driveshafts are designed to work seamlessly in any vehicle to allow operators to engage, lift, and transport heavy loads with more precision.



### Mining

Dana designs complete drive and motion systems to meet increasing industry demands for automation and productivity, coupled with high safety standards. Our solutions are specially engineered to maximize vehicle performance in extremely harsh environments.



### Construction and Forestry

Integrated drive and motion systems from Dana enhance construction equipment performance, efficiency, and productivity with a range of solutions for vehicles ranging from 3 to 50 tonnes (4 to 55 tons). Spicer® axles, wheel drives, transmissions, driveshafts, and Brevini™ motion products are integrated with the most advanced technologies for improved machine operation on any job site, in any condition.





# Bulk Material Applications

Meeting the needs of clients in mining and bulk material industries around the world, Dana offers a wide range of Brevini® products for industrial applications and self-propelled machines – from planetary gearboxes to helical and bevel helical gearboxes to winches. Whether a customer requires standard products or individual solutions engineered specifically for their needs – Dana can deliver a customized solution.

In applications that require low-speed power transmission, the gearbox plays an essential role in power conveyance. Brevini® products offer advanced, innovative solutions for these critical power needs.

With satisfied customers at leading bulk material and mining companies across all continents, we deliver proven, reliable technology driven by a talented team of engineers who are continuously focused on innovation.



Bulk Material Handling equipment is typically composed of stationary or mobile machinery such as bucket wheel excavators, conveyors, stackers, reclaimers, wagon tippers, ship-loaders, combined with storage facilities such as stockpiles and silos. Excavation, transportation, sizing, stockyard storing, homogenization and reclamation are all part of the mining processes we support. Our offering includes consulting, systems design, engineering, procurement, erection and support, for turn-key projects, individual new equipment or upgrades and modernizations.



# Stacker Reclaimers

These versatile machines operate as both stacker and reclaimer, stacking material in stockpiles and reclaiming loads with a bucket wheel at the tip of the boom.

Often less costly than maintaining a dozer fleet, stacker reclaimers can move in three directions: horizontally along the rail, vertically by lifting its boom, and rotationally by slewing its boom.

Applications include stacking and reclaiming in ports, wharfs, steel plants, coking plants, coal storage plants, power plants, metallurgical plants, cement plants, and other bulk material storage yards.



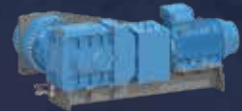
## Slewing Drive



## Bucket Wheel Drive



## Long Travel Drive



### Brevini® Plano Helical Gearboxes – High Power Series

- Extensive ratio range
- Supports torque range up to 2200 kNm
- Increased thermal capacity due to shared oil chamber
- Spheroidal graphite cast iron housing
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Low noise



### Brevini® Helical Bevel Helical Gearboxes – Posired 2 Series

- Extensive ratio range
- Supports torque range up to 1300 kNm
- Increased thermal capacity
- Spheroidal graphite cast iron housing available
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Reliable operation
- Low noise



### Brevini® Planetary Gearboxes – Slewing Drives

- Modular design, coaxial or right angle
- Customized short or long output support
- Supports torque range up to 370 kNm
- Light, compact solution
- Output pin variation to meet a range of customer needs
- Premium sealing
- Spheroidal graphite cast iron housing



### Brevini® Plano Helical Gearboxes – Compact Drives

- Light, compact solution
- Spheroidal graphite cast iron housing
- Supports torque range up to 40 kNm
- High efficiency
- Premium sealing
- Easy to assemble/disassemble



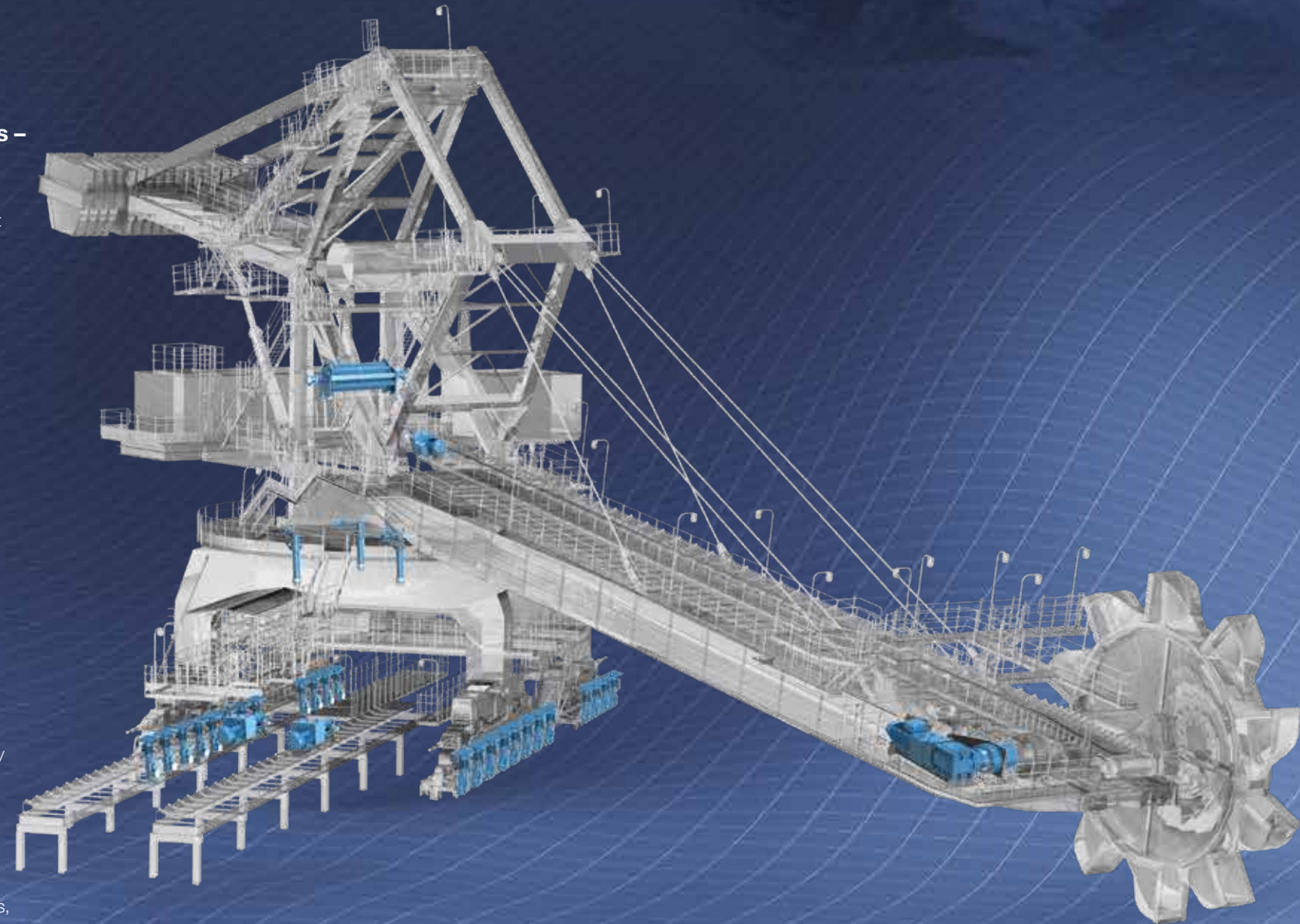
### Brevini® Winches and Winch Drives

- Standard and special configurations lifting up to 35 tons
- Suitable for hydraulic or electric motor
- Different drum options and custom design
- Many electronic controls available
- Integrated hydraulic motor for compact solution
- Certified for marine applications



### GWB® Cardan Shaft

- Complete product range featuring flange/swing diameter from 120 to 1300 mm
- Superior bearing life
- High torque capacity
- Designed for ease of maintenance with service-free option
- Engineered to withstand harsh conditions, proven with a 70-year history on the market
- Minimized total cost of ownership



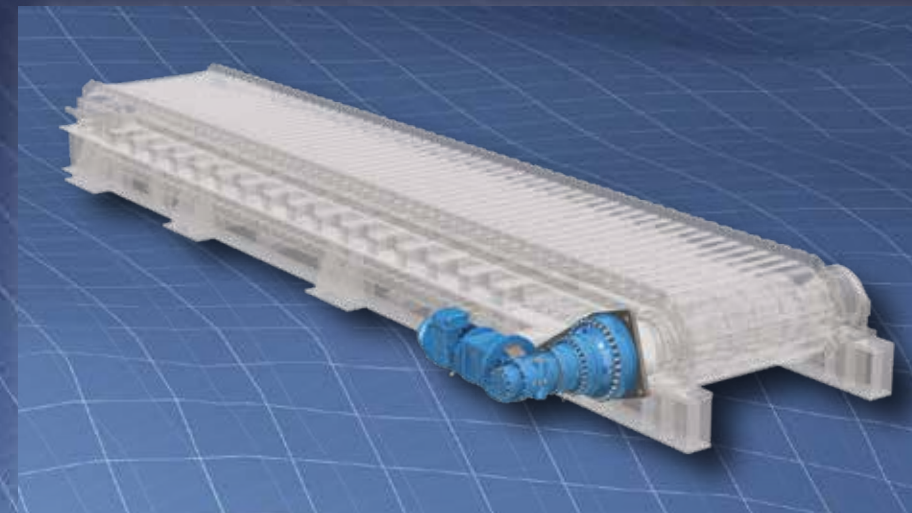
Dana offers customized solutions to meet a range of customer needs, including modular designs and add-on accessories.



# Conveyors and Apron Feeders

Conveyors and apron feeders are widely used in the process of handling bulk material. Conveyors are the workhorse of mineral handling, often used in dry processing plants where they play a key role in stabilizing process flow. Typically used for small lump sizes with long-distance paths, conveyors are generally selected based on four factors: tonnage, size and type of material to be processed, incline, and distance.

Apron feeders are necessary whenever the application requires a uniform flow of dry or moist fractions of rock or minerals. They are generally categorized by the size of material to be fed through the machine, and are typically used for short distances to extract bulk material from dump hoppers, bins, and stockpiles.



## Brevini® Industrial Planetary Gearboxes – S Series

- Modular concept
- Extensive ratio range
- Supports torque range up to 2200 kNm
- Increased thermal capacity due to large bevel set
- Spheroidal graphite cast iron housing
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Low noise
- IEC flanges up to 355 size



## Brevini® Plano Helical Gearboxes – Compact Drives

- Light, compact solution
- Spheroidal graphite cast iron housing
- Supports torque range up to 40 kNm
- High efficiency
- Premium sealing
- Easy to assemble/disassemble



## Brevini® Helical Bevel Helical Gearboxes – Posired 2 Series

- Extensive ratio range
- Supports torque range up to 1300 kNm
- Increased thermal capacity
- Spheroidal graphite cast iron housing available
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Reliable operation
- Low noise



## Brevini® Plano Helical Gearboxes – High Power Series

- Extensive ratio range
- Supports torque range up to 2200 kNm
- Increased thermal capacity due to shared oil chamber
- Spheroidal graphite cast iron housing
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Low noise

## Conveyor Drive



## Apron Feeder



Dana offers customized solutions to meet a range of customer needs, including modular designs and add-on accessories.



# Ship-Loaders and Unloader

These large pieces of equipment are used in shipyards to load and unload solid, bulk material such as iron ore, coal, fertilizer, grain, and others.

Generally mounted on rails or sometimes tyres, ship-loaders and unloaders can move to access the length of the ship. Using separate drives, their booms can also move from front to back or up and down in order to fill the breadth of the cargo hold, and adapt to the ship's

fluctuating draught while it is being loaded or unloaded. While unloading, even and complete filling of the cargo holds are facilitated by a special telescoping chute with a rotating, pivoting spoon.

Ship-loader – Iron Ore



Ship-loader – Potash



## Brevini® Planetary Gearboxes – Slewing Drives

- Modular design, coaxial or right angle
- Customized short or long output support
- Supports torque range up to 370 kNm
- Light, compact solution
- Output pin variation to meet a range of customer needs
- Premium sealing
- Spheroidal graphite cast iron housing



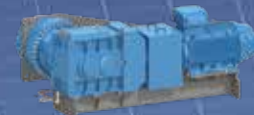
## Brevini® Helical Bevel Helical Gearboxes – Posired 2 Series

- Extensive ratio range
- Supports torque range up to 1300 kNm
- Increased thermal capacity
- Spheroidal graphite cast iron housing
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Reliable operation
- Low noise
- Auxiliary drives



## Brevini® Winches and Winch Drives

- Extensive ratio range
- Supports torque range up to 1300 kNm
- Increased thermal capacity
- Spheroidal graphite cast iron housing available
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Low noise



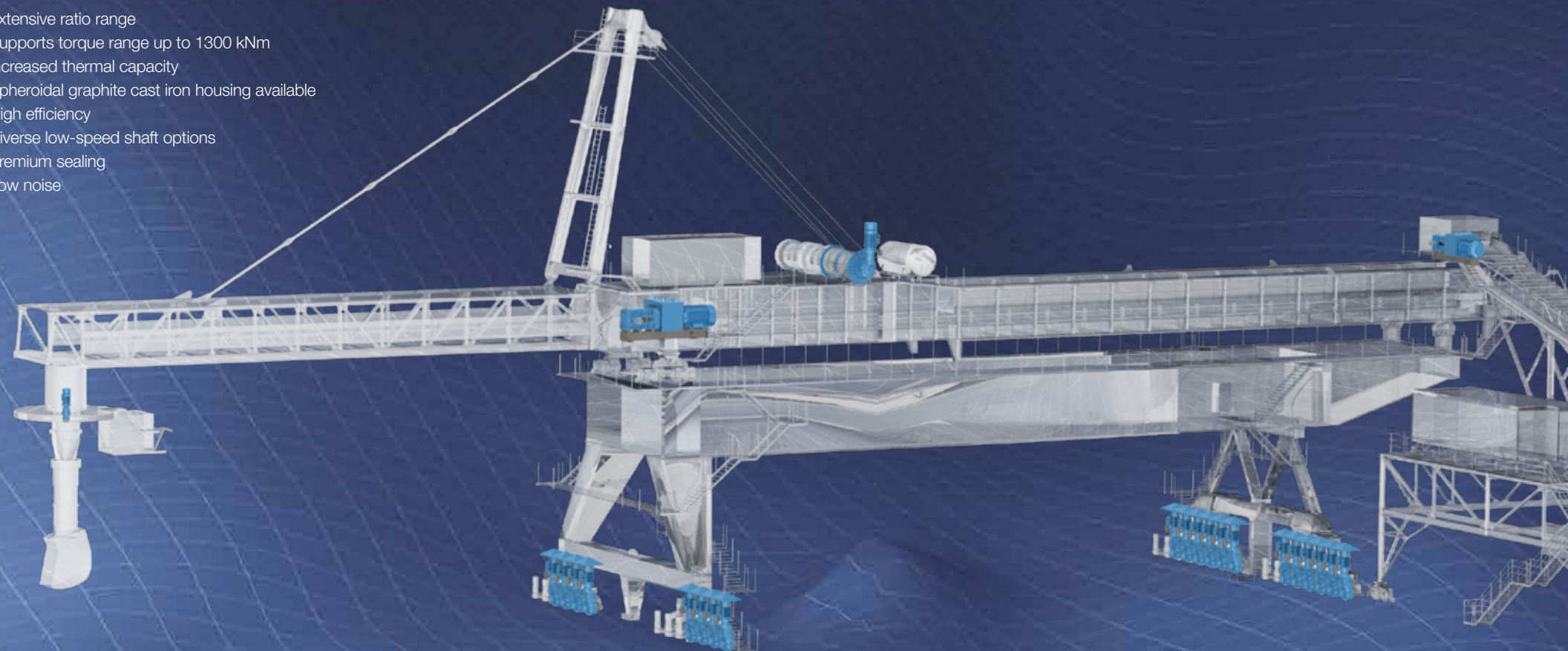
## Brevini® Plano Helical Gearboxes – High Power Series

- Extensive ratio range
- Supports torque range up to 2200 kNm
- Increased thermal capacity
- Spheroidal graphite cast iron housing due to shared oil chamber
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Low noise



## Brevini® Plano Helical Gearboxes – Compact Drives

- Light, compact solution
- Spheroidal graphite cast iron housing
- Supports torque range up to 40 kNm
- High efficiency
- Premium sealing
- Easy to assemble/disassemble



Dana offers customized solutions to meet a range of customer needs, including modular designs and add-on accessories.



# Roller Presses

In order to crush ore, roller presses, or high-pressure grinding rolls (HPGR), utilize two counter-rotating rolls – one fixed and one movable. Compared to traditional systems, this design is more stable and efficient.

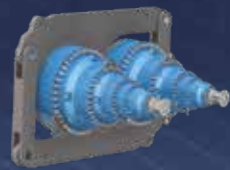
Roller presses can be used for grinding as well as compacting. The drive power is transferred to the grinding rollers via multi-stage **Brevini**® planetary gearboxes, which are mounted on the drive end of the roller shaft using shrink disc coupling or a low-speed flange.

Traditional drives above 400 kW are equipped with fluid- or torque-limiter coupling and a cardan shaft. Bulk material is fed through the gap between two rollers, then through a feeding device on top of the machine, which can vary depending on feeding method.

Plano Helical Gearbox



Industrial Planetary Gearbox



## Brevini® Industrial Planetary Gearboxes – S Series

- Modular concept, can be customized to customer needs
- Supports torque range up to 2200 kNm
- Spheroidal graphite cast iron housing
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Reliable operation, engineered for harsh conditions
- Low noise
- Special torque arm systems

### Accessories

- Mechanical torque limiter or Safeset
- GWB® cardan shaft
- WTO coolers
- Vibration and temperature sensors
- Fluid coupling



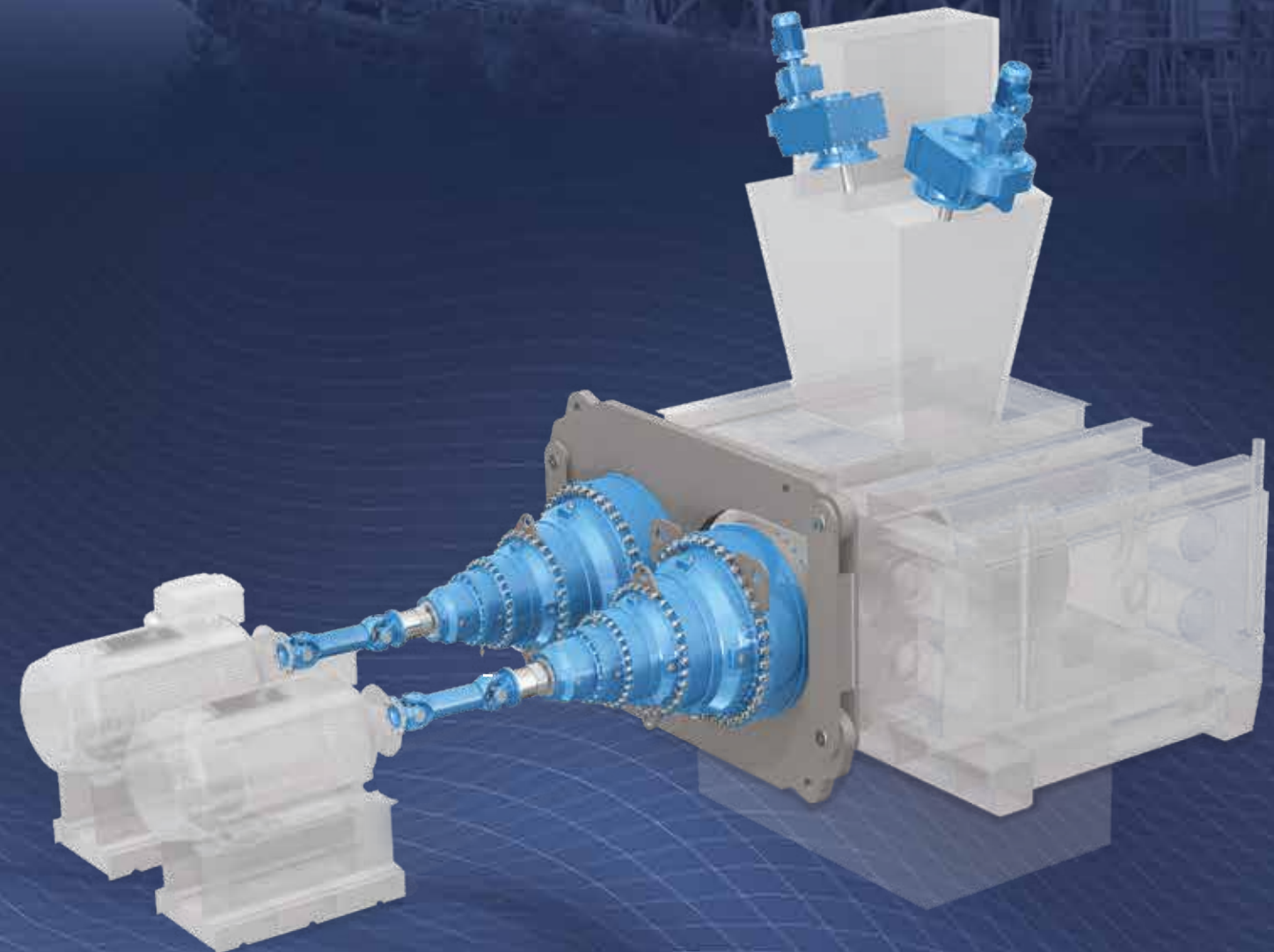
## GWB® Industrial Driveshaft

- Complete product range featuring flange/ swing diameter from 120 to 1300 mm
- Superior bearing life
- High torque capacity
- Maintenance: friendly design with service free option
- Engineered to withstand harsh conditions, proven with a 70-year history on the market
- Designed to minimize total cost of ownership



## Brevini® Helical Bevel Helical – Gearmotors

- Extensive torque range
- High efficiency
- Diverse low-speed shaft options
- Low noise
- Robust housing made in cast iron GG20-22**



Dana offers customized solutions to meet a range of customer needs, including modular designs and add-on accessories.



# Wagon Tiplers and Positioners

Wagon tipplers are used to unload bulk material from wagons, including materials such as coal, coke, lignite, iron ore, limestone, dolomite, and others. A complete wagon tippler system includes the positioning system, car dumper, and underground hopper along with feeders below the hopper to release bulk material.

The wagon is positioned in the tippler with special positioner drives, VFD controlled using a rack-and-pinion system.

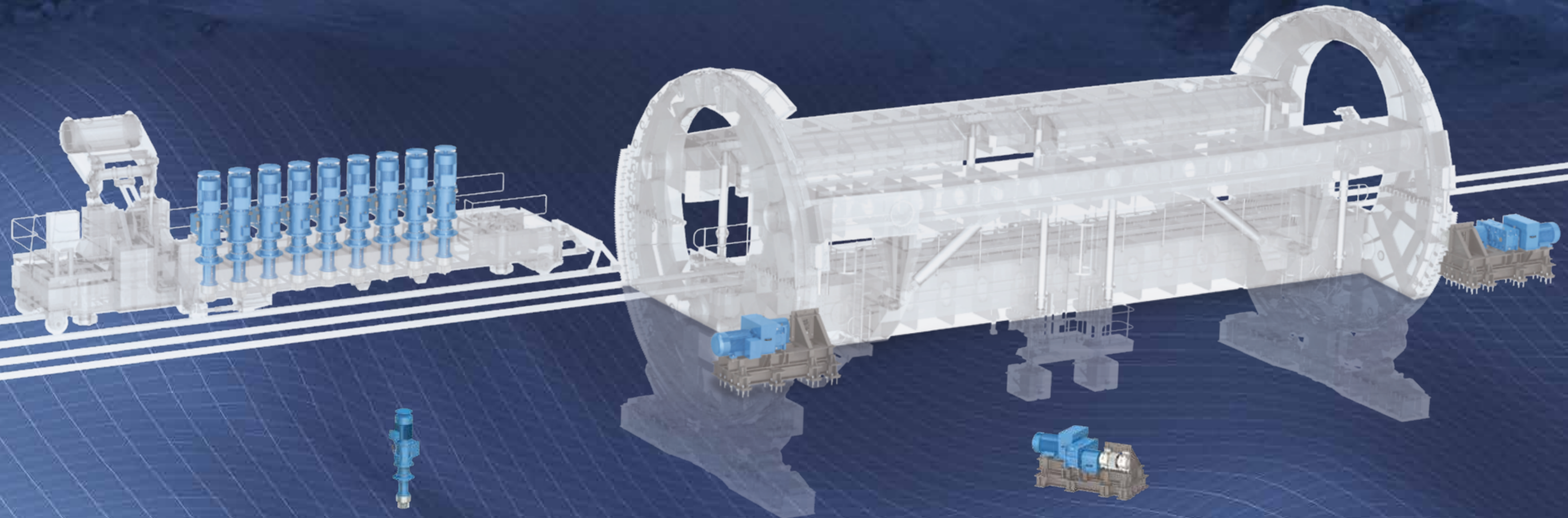
Alternatively, a wire rope cable-and-drum arrangement can be used. The wagon is dumped using a specific heavy-duty rack-and-pinion drive to position it downward in the machine pit.

Depending on the application, this machine can be designed with a single, tandem, triple, or quadruple dumper frame. Every wagon tippler system is engineered to meet customer needs based on the type of bulk material that will be unloaded.

## Wagon Tippler



## Positioner



### Brevini® Plano Helical Gearboxes – High Power Series

- Extensive ratio range
- Supports torque range up to 2200 kNm
- Increased thermal capacity due to shared oil chamber
- Spheroidal graphite cast iron housing
- High efficiency
- Diverse low-speed shaft options
- Premium sealing
- Low noise
- Customized male shaft with keyway



### Brevini® Planetary Gearboxes – Slewing Series

- Improved thermal capacity
- Robust design
- Reliable operation, engineered for harsh conditions
- Spheroidal graphite cast iron housing for low-temperature applications
- Custom-made output support and pinions



### Brevini® Package Helical and Bevel Helical Gearboxes – Posired 2 Series

- Complete drive system including base and bed plate
- Supports torque range up to 1300 kNm
- Spheroidal graphite cast iron housing
- High efficiency
- Premium sealing
- Reliable operation
- Low noise

Dana offers customized solutions to meet a range of customer needs, including modular designs and add-on accessories.



# Global Strength

One of the ways we create value is by **positioning** our technical and manufacturing resources where customers need us globally.

Dana's **worldwide leadership** is the key to serving clients around the world. We bring our global expertise to the local level with technologies customized to individual requirements through a network of strategically placed technology centers, manufacturing locations, and distribution facilities.

Our strength is being over six continents thanks to our global logistic network.

Today, that's **33 countries** on **six continents**.

To help customers achieve success, top-tier suppliers must have a global perspective that can be adapted to meet local requirements and end-user expectations.





# Market-Driven **Innovation**

## Off-Highway Performance Expectations

Safety

Productivity

Maneuverability

Durability

Serviceability

Total Cost of Ownership

### **About Dana Incorporated**

Dana is a leader in the design and manufacture of highly efficient propulsion and energy-management solutions for all mobility markets across the globe.

The company's conventional and clean-energy solutions support nearly every vehicle manufacturer with drive and motion systems, electrodynamic technologies, thermal, sealing, and digital solutions.

### **About Dana Off-Highway Drive and Motion Systems**

Dana delivers fully optimized solutions to customers in the construction, agriculture, material handling, mining, and industrial markets.



**Dana.com/oh**  
**Dana-industrial.com/contact-us**

#### **Application Policy**

Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.

