



# ENGINEERED SOLUTIONS

Linear Positioning

Rotary Positioning

E-Stop and Power-off

Engaging and Disengaging a Load

Stopping and Holding a Load

Industri 4.0 Solutions

Overload Protection

**nexen**

[www.nexengroup.com](http://www.nexengroup.com)

# PROVIDING SUPERIOR MOTION CONTROL SOLUTIONS FOR OUR PARTNERS ONE SUCCESS AT A TIME

## NEXEN GROUP, INC.

has been producing industrial motion control products for over 70 years. Our customers span all types of industries ranging from large multi-national corporations to small regional businesses, and from OEM machine designers and system integrators to plant management & maintenance personnel.

Regardless of the industry or profession, the reasons our customers continually specify Nexen products remain the same:

- 1 we partner with our customers to provide cost-effective, on-schedule solutions, and;
- 2 our solutions are simple, durable, high-quality products that our customers trust and can depend on.

*Nexen corporate headquarters in Vadnais Heights, MN, and manufacturing in Webster, WI is supported by more than 40 worldwide sales offices and over 1,500 distributor sales outlets.*

## THE NEXEN ADVANTAGE

At Nexen, our heritage is built on producing technically-superior products coupled the highest level of customer support:

- Long product life
- Minimal downtime
- Inexpensive to operate
- Easy to understand, install and maintain
- High efficiency and productivity
- Operational versatility
- Mounting flexibility
- Custom design services available

For more information on all Nexen products not discussed in this brochure, please visit our website at [www.nexengroup.com](http://www.nexengroup.com).

## TESTIMONIALS

"Nexen's application engineering department was very professional, responsive and offered various solutions including custom designs if needed. Additionally, we required competitive commercial requirements and long-term availability of components. It was a plus that Nexen manufactures in the US with a convenient location to an international airport. Nexen's RPS product eventually won the business due to their product being the best fit and quite superior in all technical aspects, ease of maintenance and superior longevity..."

***Mitch Larson, President, MESH Automation Inc.***

## NEXEN MOTION CONTROL APPLICATIONS

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## INDUSTRIES & APPLICATIONS SERVED

Automated Welding

Aerospace

Automation Equipment

Automotive

Bottling & Food Processing

CNC Routers

Commercial Laundry Equipment

Elevator & Lifts

Gantry Systems

Injection Molding Machine Tools

Robots & Robotic Work Cells

Semi-conductor



# STOPPING & HOLDING A LOAD:

## Power-off, E-stop, or Zero backlash Requirements



### SERVO BRAKES

With fail-safe reliability, Eclipse® servomotor brakes hold each joint securely to prevent any arm movement during power-off situations.

Servomotor brakes stop the load(s) quickly and safely with bidirectional braking capabilities.

#### Product Highlights

- Holds in both vertical and horizontal orientations
- Models for all major servo motor manufacturers
- Low backlash
- No wearing parts, lubrication or maintenance

#### Typical Applications

- Automotive
- Cyclical operations
- Food production, meets IP67
- Gantry routing
- Semiconductor



### BALL SCREW BRAKES

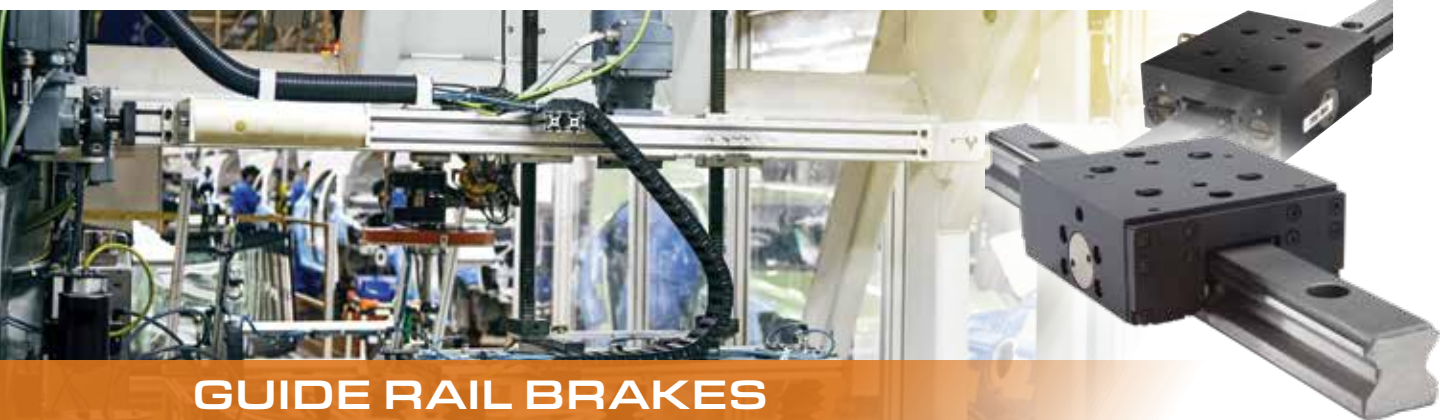
A frequent requirement in Aerospace manufacturing is to eliminate load back-driving on precision ball screws in vertical orientation. Spring Engaged, mechanical lock technology assures high torque capacity and low backlash.

#### Product Highlights

- Power-off/spring engaged/air released
- Bi-directional braking
- Fast engagement
- Low backlash & inertia
- Allows thermal expansion of ball screw

#### Typical Applications

- Custom lifts
- Work platforms
- Dust & waterproof conditions meets IP67
- Machining centers



## GUIDE RAIL BRAKES

Guide Rail Brakes with mounted sensors indicating the state of operation are ideal for E- stop and redundant safety braking applications.

Protecting the safety of operators and machines are playing greater roles in machine design.

### Product Highlights

- Holds in both vertical and horizontal orientations
- Models for all major rail manufacturers
- Clamps directly on center of the guide rail
- Low backlash
- No lubrication or maintenance required

### Typical Applications

- Medical equipment & hospital beds
- Gantry Axis braking
- Industrial Door Open/Close locking
- Window and Door Mfg.
- Primary and Secondary Packaging



## ROD LOCKS

Motor coil winding equipment requires precise holding, fast engagement and high cycle rates over millions of cycles. Rod locks are used to hold the stator platform as wire coils are packed into the stator.

A second application is holding the coil-winding apparatus during the winding operation.

### Product Highlights

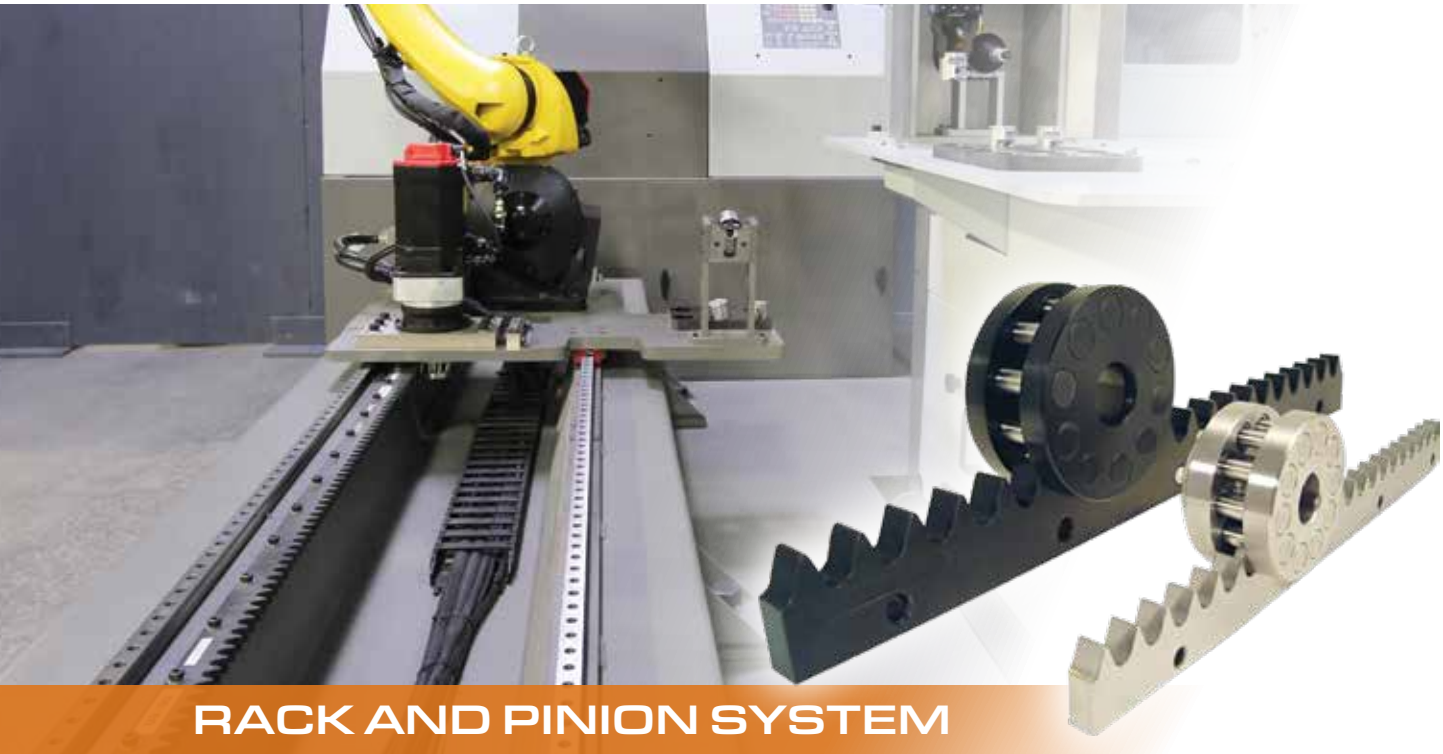
- Models for round guide rail and air cylinders
- Precision operation maintains accurate positioning
- Large clamping surface ensures consistent performance
- Sealed to withstand environments- meets IP67 & NEMA 4
- Spring-engaged units engage in Power-off situations

### Typical Applications

- Cyclical operations
- Food production, meets IP67
- Gantry routing
- Platen presses
- Automotive Production

# LINEAR POSITIONING:

## Precise, High Speed, Zero-Backlash



## RACK AND PINION SYSTEM

### Superior Positional Accuracy & Repeatability

A custom automation equipment builder utilizes pre-engineered transfer modules. The medium payload unit requires:

- Speeds of 4m/s with acceleration of 3m/s<sup>2</sup>
- High moment loads (up to 10,000Nm)
- Path accuracy of 0.025mm
- Repeatability of 0.005mm and positional accuracy of 0.03mm
- Required operation in dirty environments such as welding, grinding and finishing

Nexen's modular RPS Roller Pinion System satisfies the design, providing  $\pm 30\mu\text{m}$  positional accuracy and  $\pm 5\mu\text{m}$  repeatability. The sealed and lubricated rollers move smoothly along the profile, resulting in zero backlash and 99% efficient rotary-to-linear-motion conversion. The tooth profile is lubricated with a high-performance light grease at installation and then every six months or 2 million pinion revolutions.

### Product Highlights

- Accuracy of  $\pm 30\mu\text{m}$  [ .001 in]
- Rated Life of up to 60 million pinion revolutions
- Speeds of up to 11 m/s [36 ft/s]
- Zero backlash, No cumulative error
- Long travel no limit to length
- Quiet operation and 99% efficient
- Low maintenance
- Pinions mount to ISO gearbox flanges or smooth output shafts

### Typical Applications

- Alternative to ball screws and rack & pinion
- Cartesian robots
- Dirty & corrosive environments
- Custom drilling & angular cutting machines
- Food Processing
- Gantry Router
- Non-destructive Testing
- Medical Imaging
- Measurement systems
- Multi-head on a common axis
- Stainless steel requirements
- Plasma & laser cutting
- Vacuum environments
- Welding and Woodworking





## Long Travel, High Speed & Accuracy with Zero Backlash

Lumco Manufacturing built a custom drilling and annular cutting machine used to make aluminum parts. The machine's transversing drillhead travels 16 feet at speeds of up to 2 f/s with multiple drill and cut stations to produce parts from aluminum sheet stock from up to 14 feet and longer.

The biggest design challenge was finding a linear motion system that met two critical criteria: being easily integrated with the machine with sufficient power to move the drillhead through large amounts of aluminum chip debris. Traditional linear motion systems including ballscrews, belt drive actuators, and standard rack-and-pinion system all failed to meet the travel, precision and/or durability requirements.

The solution came with Nexen RPS roller pinion system with speed capability of 36 f/s and accuracy to within  $\pm 0.00118$  inch. Unlike a traditional rack and pinion system, the RPS features a pinion consisting of 10-12 needle-bearing supported rollers that engage a rack tooth profile.

## TESTIMONIALS

"The system [provides] us all the accuracy and speed of a ballscrew at any length of travel we need, and [it] gives us more options to package servo axes. We're no longer dependent on the traditional ballscrew approach, which limited the length and speed of [our] machine design. Most importantly, our customer is very happy with the machine performance."

**Mike Morris, President, Lumco Manufacturing Co.**

"The RPS made the machine design straight forward. Also, performance [expectation] was exceeded while maintaining our budget."

**Cody Larson, Product Manager, MESH Automation Inc.**

# ROTARY POSITIONING:

## The Heart of Many Machine Cells



### GEARS & GEAR SEGMENTS

An oversized CNC machine house required an 11.4 meter diameter gear with very high precision. Getting a gear this large machined and shipped was not impossible, but very costly.

Utilizing smaller segments of the gear to assemble the full gear allowed for lower system cost, simple transport, and easier installation.

#### Product Highlights

- External or internal teeth
- High rotary accuracy with zero backlash
- Gear segments have the versatility to create a range of arc lengths or full rings
- An alignment tool allows for precise joining of more than one segment
- Standard and custom gears are available

#### Typical Applications

- Custom Machines
- Consumer Goods
- Packaging
- Assembly
- Pharmaceutical



### ZERO BACKLASH GEARED BEARINGS

Geared Bearings provide a great solution where customization and tight spaces require the perfect fit. A manufacturer required a low profile system but could not find a good existing indexer system to fit the torque, mounting configuration, and diameters required.

The geared bearing provided the optimum solution for the price versus and minimizing the size requirement of the total machine package.

#### Product Highlights

- High positional accuracy
- Zero backlash
- No cumulative error
- High speed & rigidity
- Low maintenance

#### Typical Applications

- Automotive
- Aerospace
- Material Fabrication
- Medical
- Robotics





## COMPACT PACKAGED ROTARY INDEXERS

An automated material handling application needed an indexing solution to work in conjunction with SCARA Robots. Utilizing a rotary dial plate is customizable for optimum efficiency.

Assembly of the small components requires a press operation at a fixture station where accuracy and repeatability is critical.

### Product Highlights

- Smooth motion - preloaded cross-roller bearings & integrated motor/precision gearhead
- Freely programmable
- Available with 150,250,350,550 mm output bolt circle
- Large open center for optimum performance in compact space
- Sealed housing IP65 available

### Typical Applications

- Bio-Technology
- Electronics/Semiconductor
- Food & Beverage
- Pharmaceutical
- Consumer Goods



## HEAVY LOAD INDEXER

A transmission case is loaded on top of a heavy load indexer and clamped in place. The Indexer rotates case aligning machine holes with press actuators inserting plugs to a specified depth/pressure.

This transmission assembly plant was having issues with machine indexing systems lacking rigidity and accuracy which were solved with the Heavy Load Indexer.

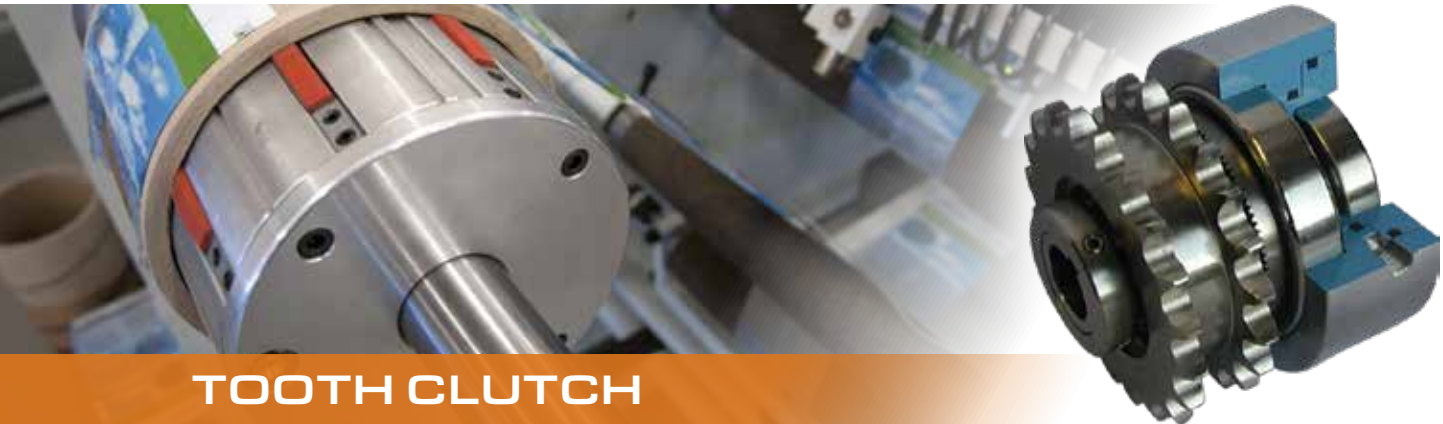
### Product Highlights

- Large center opening ideal for pass-through integration
- Rigid System with smooth rotary motion
- Unlimited rotary output displacement
- Output baring design is ideal for 'Headstock/Tailstock' automation
- Maintenance- free performance

### Typical Applications

- Robotics Integration
- Aerospace
- Assembly/Custom Machines
- Defense
- Theme Parks and Theatrical

# ENGAGING AND DISENGAGING A LOAD



## TOOTH CLUTCH

A tooth clutch, or multiple tooth clutches can be mounted on a single shaft providing synchronization, engaging at the same place every time, and simulating various operating specifications.

A very good solution to ensure the necessary timing for an entire machine system.

### Product Highlights

- Accurately adjustable torque
- Air-engaged/spring-released or Spring-engaged/air released
- Single or multi-position designs
- Variable mounting options on either the motor or driven shaft with a pulley, sprocket, or flexible coupling on the pilot

### Typical Applications

- Filling & Capping machines
- Dynamometers
- Hydrostatic drive systems
- Accurate Positioning Registration
- Reversing/multi-speed

## TESTIMONIALS

"We rely on the accuracy, performance and durability of Nexen's clutches and brakes. They give me confidence in the performance of my machines. The Nexen engineering team is involved from the start and is easy to get a hold of and work with on our design requirements. In our market everything is about speed, quick delivery and a quality design without worrying about hitting delivery deadlines."

**Tony Kliber, Chief Mechanical Engineer, IQa Engineering**





## FRICTION CLUTCHES

A manufacturer of packaging and filling machines required small, reliable clutches in their capping machines. These clutches tighten the caps onto containers and bottles and consistent torque delivery is critical for repeatability.

The clutch output torque also needed to be adjustable for different caps types and torque levels.

### Product Highlights

- Air-engaged/spring-released
- Accurately adjustable torque
- High heat dissipation and dynamic torque
- Variable mounting options on either the motor or driven shaft with a pulley, sprocket, or flexible coupling on the pilot

### Typical Applications

- Connect/disconnect
- Controlled acceleration
- Cycling/indexing
- Inching/jogging
- Rewind Tension Control



## CLUTCH/BRAKE COMBINATIONS

A wash-down capable, clutch-brake for conveyor systems used for baking and food processing. The clutch-brake mounts between a wash-down motor and gear reducer.

This allows the motor to run continuously extending the life of the motor.

### Product Highlights

- Air-engaged/spring-released or Spring-engaged/Air released
- Use with 0.09- 14.6 Kw [1/8-20 HP] Motors
- Fits NEMA frame sizes 48Y to 256TC
- Fits IEC frame sizes D71C to 160M
- Flange or foot mounting

### Typical Applications

- Accurate Positioning
- Controlled acceleration
- Controlled deceleration
- High inertia start/stop
- Inching/jogging



# STOPPING & HOLDING A LOAD DURING MACHINE OPERATION



## AIR ENGAGED FRICTION BRAKES

Large format commercial washing machines must stop the spinning drum in the event of an emergency. The weight of wet clothes and water spinning at high speeds require a brake that has both a large amount of torque and a high heat sink/thermal capacity to stop the washing drum in a safe time frame.

### Product Highlights

- Air-engaged/spring released
- High heat dissipation and friction work capacity
- Variable mounting options: horizontal or vertical
- Self-adjusting for friction facing wear

### Typical Applications

- Accurate positioning
- Controlled deceleration
- Cycling/Indexing
- Stopping/Holding
- Unwind tension control

## TESTIMONIALS

"We are a major producer of global commercial laundry equipment. Our customers are demanding and put our products through very harsh and demanding use. We rely on the performance that the Nexen brake gives us. Our products are at all ends of the globe and even on ships that cruise the waters. The Nexen brake has proven to be as tough as our machines. We have come to expect this kind of performance with the starting and stopping punishment we put the brake through and cannot afford to have to service these braking products due to performance break downs."

**G.A. Braun, Inc., David Welsh, Director of Operations**



## CALIPER BRAKES

Coiled tubing equipment for land and off-shore applications depend on the ability to dynamically stop as well as have an emergency stop.

This was critical for the safety of the operators working around these large and high inertia devices.

### Product Highlights

- Proximity sensor feedback available
- Quick change of friction material on the brake pads
- Quick dump air valve for extremely fast response
- Air-engaged/spring released
- Spring-engaged/air-released
- Spring-engaged/hydraulic released

### Typical Applications

- Counter weighted elevators
- Controlled deceleration
- Cycling/Indexing
- Positioning
- E-stop



## SPRING ENGAGED FRICTION BRAKES

Automotive production operations depend on stopping a rotating load with safe power off operation. Knowing when the brake is engaged or disengaged contributes to overall system success.

NEMA C-faced or IEC B5 flange mounting and totally enclosed (IC65) models can operate in the most demanding of environments.

### Product Highlights

- Spring-engaged/air released
- Manual Release Available
- High dynamic torque/self-cooling design
- Field Upgrades
- Power off Holding

### Typical Applications

- Framing and Stamping E-stop
- Compression Tension Holding
- Machine Carriage braking
- Rotary Torque braking/holding
- Roll Converting braking



# INDUSTRI 4.0 SOLUTIONS



## ZSE BRAKE

### Product Highlights

- Sensors monitor engagement/disengagement aids with:
  - Motor/drive programming
  - Safe machine/system design
  - Operational feedback
- Spring engaged/air released
- Zero backlash to 100% of rated torque
- Sensors monitor internal temperature aids with:
  - Avoiding overheat conditions
  - Maximizing unit life
  - Maximizing operating RPM
- Maximum speed up to 5,000 RPM
- Brake life exceeds 2 million cycles
- Open through bore allows a wide of shaft diameters
- Cool operation
- Low inertia
- Hygienic stainless steel option
- Zero backlash coupling
- Compact & Enclosed design

### Typical Applications

- Assembly/inspection tables
- Automotive
- Pharmaceutical
- Consumer goods
- E-stop safety, power-off holding
- Trunion Tables

## TESTIMONIALS

"Nexen had the right brake, quick support and delivery time that easily integrated into our machine design. Whenever we need Nexen, they are always there!"

A personal visit from both the Nexen Sales & Engineering team with a demo ZSE brake unit let us see the benefit of its design. Nexen's Engineering, Manufacturing & Procurement Groups accepted this challenge with an immediate response providing a solution that met our delivery and performance requirements/expectations.

**Werner Bohner—President & Owner Lorik Tool**



# OVERLOAD PROTECTION



## AIR ENGAGED TORQUE LIMITER

An air engaged torque limiter acts as a clutch to start an auger machine rotation and acts as an overload-sensing device in the event of a jam up in the feed mechanism. The torque limiter is mounted on the driven shaft and coupled to the gear reducer output shaft.

### Product Highlights

- Air-engaged/spring-released
- Accurately adjustable torque
- High heat dissipation and dynamic torque
- Variable mounting options on either the motor or driven shaft with a pulley, sprocket, or flexible coupling on the pilot

### Typical Applications

- Connect/disconnect
- Controlled acceleration
- Cycling/indexing
- Inching/jogging
- Soft Starts



## MECHANICAL TORQUE LIMITER

A mechanical torque limiter, installed between the output of a gear reducer and the driven shaft, protects the gear set if an overload happens on the conveyor system. The coupling bores are made specific to the gear box output shaft and main drive shaft. The elastomer transmits torque without backlash or vibration.

### Product Highlights

- Use with 0.09-14.6 Kw [1/8-20 HP] Motors
- Fits NEMA frame sizes 48Y to 256TC
- Fits IEC frame sizes D71C to 160M
- Flange or Shaft Mount

### Typical Applications

- Accurate Positioning
- Controlled acceleration
- Controlled deceleration
- High inertia start/stop
- Inching/jogging



# CUSTOM SOLUTIONS

Nexen's Custom Product Team can easily help translate your special application requirements creating options and product variations to fit your unique machine design.

Our team consists of application and technical personnel, design and manufacturing engineers who have experience working with original equipment manufacturers (OEM's) and end user markets for over 20 years.

**Examples of our custom capabilities include:**

- Special coatings, plating, painting
- Material changes, stainless steel, etc..
- Tooth clutch positioning options
- Friction material variations
- Custom sprocket, pulley or sheave configurations
- English to metric component coupling
- Dimensional changes
- Bore and keyway modifications

We may already have custom or modified product designs that readily fit your application.

Contact our Custom Product Team today to discuss your design requirements.

***We're confident we can help!***

**nexen**

**Nexen Group, Inc.**

560 Oak Grove Parkway  
Vadnais Heights, MN 55127

[www.nexengroup.com](http://www.nexengroup.com)

800.843.7445

Fax: 651.286.1099