THE ART OF PERFORMANCE GEARING
POWERED BY EXPERIENCE
Milwaukee Gear manufactures custom steel gears, pinions and assemblies for OEM market leaders that require case hardened helical and spur ground tooth gears to exacting specifications with traceability and reliable lead times. We help our customers to be successful with design assistance and process engineering optimization. Our engineering talent, on site heat treatment capabilities and passion for excellence for over 90 years has earned Milwaukee Gear a sustained customer base.

**WE CAN SERVE YOUR SPECIFIC NEEDS**

**BASIC**
- Part to print
- Heat treatment

**ADVANCED**
- Precision gear and pinion manufacturing
- Optimizing current designs
- Partner to develop new more cost effective torque dense designs
- Bundle multiple components into a sub-assembly to reduce number of vendors
- Providing repair services

**SERVICE**
- Field monitoring & diagnostics
CONSISTENT PROCESSES, INTERNALLY CONTROLLED

MILWAUKEE GEAR PRODUCTS

- External gears
- External gear assemblies
- Internal gears
- Pinions
- Pinion assemblies
- Double helical
- Specialty parts
- Rapid prototypes
- Custom gear boxes
- In-house heat treat

WITH REGAL PTS...
WE CAN NOW OFFER YOU

Milwaukee Gear performance gearing combined with...

Subassemblies including bearings to simplify complexity,

Example of double helical ground to AGMA Q11
Kop-Flex® repair services,

Supported by Regal® PTS Lifecycle Services

- Tools and techniques used to measure the performance of a customer’s application
- Training conducted at customer location, off-site or PTS factory
- Assist customers in reviewing application needs and help select appropriate products
- Will provide a product manager, general contractor or consultant for the installation as well as additional labor
- Electrical power monitoring, mechanical torque/power monitoring, thermal conditioning, ultrasonic measurement monitoring
- Repaired/refurbished products come with a factory warranty at a fraction of the price of a new product
### ADDITIONAL SERVICES

#### TYPICAL GEAR SPECIFICATION OUTLINE

- 8620 bearing quality steel
- Carburized, die quench and ground
- AGMA class 12
- Rating reviewed for target design life

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<th>WHAT THEY DO</th>
<th>WHAT WE DO</th>
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#### GEAR TESTING CAPABILITIES

- State of the art gear inspection equipment
- Automated nital etch system - fully submerge
- Micro hardness testing
- Carbon analysis
- In-house destructive and non-destructive testing
- Full metallurgical lab
- On-staff metallurgist
- Reverse engineering and design optimization via KISSsoft and LVR

#### EXPERIENCE WITH THE TOTAL PROCESS PROVIDES...

- Proper tooth cutting to anticipate distortion
- Proper uniform case depth
- Proper transition to Root, no stress risers
- Optimized performance and and life
SUMMARY OF KEY CAPABILITIES

DESIGN AND OPTIMIZATION

• Design optimization using state-of-the-art gear software
• Engineering experience to troubleshoot application and performance problems, professional failure analysis
• Automated pricing
• Fast response

GEAR MANUFACTURING & INSPECTION

• Hobbing & grinding capacity to 78” OD
• In-house heat treatment
• AGMA Class 10 to 15
• Precision gear geometry measurement and documentation
• Large Kop-Flex couplings, spindles and U-joints
• Full nital etch inspection to ensure no grinding burns
EXTERNAL GEARS

- Pitch: 48 to 0.5 DP (0.53 to 50.8 Module)
- Narrow gap spur, helical and double helical
- Quality levels to AGMA Q15/A2/ISO A2
- Maximum gear grinding diameter to 78 inches OD
- Specializing in Carburized and Die Quenched Gears

EXTERNAL GEAR ASSEMBLIES

Assembly Options:
- Bolted Together
- Shrink Fit
- Electron Beam Welding
- Dynamic balancing
- Static Balancing
- Gear face angle grinding

INTERNAL GEARS

Pitch: 48 to 1 DP (0.53 to 25.4 Module)
- Milling up to 49 inches
- Shaper Cutting up to 50 inches
- Quality Levels to AGMA Q15/A2/ISO A2
- Spur and Helical
- Gear grind up to 78 inches OD
- Broach up to 80 tons
PINIONS

Milwaukee Gear has the technology to manufacture extremely critical high speed pinions which operate at speeds that require near perfect machining.

- Spur and Helical
- Pitch: 48 to 0.5 DP (0.53 to 50.8 Module)
- Manufacture up to 80 inches in length
- Quality Levels to AGMA Q15/A2/ISO A2

PINION ASSEMBLIES

Our Capabilities Include:

- Hard Chrome Plating
- Thin Dense Chrome Plating
- Dynamic Balancing
- Electrical Run Out Compensation
- Proficient with high alloy metals
- Timed Double Helical Pinions, Keyed, Splined, or EB Welded
**HIGH SPEED**

We have the capabilities to manufacture high precision gears for dependable performance and service life.
Proficient in face angle grinding on pinions and gears.
Our progressive production techniques provide high precision gears with speeds up to 70,000 RPM.

**DOUBLE HELICAL**

The narrow gap double helical option provides 20% more rating than spur gear with no induced thrust.
Assembly options:
- Electron Beam Welding
- Option to Herringbone gear is a bolted design with no gap between LH & RH gears
- Design assistance is available to identify optimum configurations and size
SPECIALTY PARTS

Milwaukee Gear is not limited to traditional gear configurations. We have the ability to manufacture precision parts beyond gearing. Examples:
- Carriers
- Couplings
- Shafts
- Clutches

RAPID PROTOTYPES

Using six sigma lean tools focusing on time, money & waste we established a Rapid Prototype program. Through process driven solutions & team commitment, we offer quick deliveries when needed. This new 4140 rolled ring nitrided spur gear assembly with 5 module & 445 mm pitch diameter was shipped in 6 weeks.

CUSTOM GEAR BOXES

Manufactured to Customer Specifications
Specializing in Planetary Configurations
Assist with Gear Design, Optimization and Rating
Custom precision turn key designs that include:
- Gearing
- Housing
- Bearings
- Shafts
- In-house spin test
HEAT TREATMENT SERVICES

CASE HARDENING
- Case Carburizing
- Carbonitriding
- Nitriding

QUENCHING
- Hot oil
- Fast oil
- Polymer
- Water

CONTROLLED ATMOSPHERE
- Hardening
- Normalizing
- Annealing
- Stress relieving
- Tempering

METALLURGICAL LAB CAPABILITIES
- Cutting/mounting and polishing equipment
- Carbon Analyzer
- Spectrometer
- Automated microhardness tester
- Microscope
- Micro hardness testing
EXPERIENCED WITH
• Gears
• Electrical Components
• Cam Shafts
• Large Castings
• And many more…

OTHER CAPABILITIES
• Two row pusher with 36x36”
• Gas nitrider 40x50”
• Die quench presses up to 48” in diameter
• Rotary furnace
• Roller hearth furnace (reheat or normalize)
• Pit carburizers
• Normalize pit furnace - 30,000# load capacity
• Open fire tilt-up furnace, 72x96” tray size
• Super 36 integral quench furnaces 36x72x36”
• Straightening up to 300 ton
• Shot Blast
REPAIR SERVICES

SPINDLE AND U-JOINT REPAIR

- 30 ton crane capacity
- Clean/degrease equipment
- Repair/upgrade
- We repair all brands
- Continuous lube spindle capabilities
GEARBOX REPAIR/UPGRADE

- Reverse engineering
- Coupling mounting
- Motor mounting
- We repair all brands

Torque Monitoring and Diagnostics
INDUSTRY APPLICATIONS

METALS
- Gearbox and coupling repair and upgrade
- Reverse engineering
- Coupling mounting
- Motor mounting
- We repair all brands

TURBOMACHINERY
- Oil-free, air and gas, integrally geared compressors
- Single & Multi- Stages, API 617 compliant
- Gear rotary positive displacement blowers
- Oil-free rotary lobe gas screw compressors
- High-performance couplings and complete high-speed gearboxes

HOISTS AND LIFTS
- Ladles
- Cranes

LIGHT AND HEAVY RAIL
- Main propulsion
- Pinion and gear assemblies
ENERGY
- Stimulation & Fracturing Pumps
- Drilling Pumps / Mud Pumps
- Well Service Pumps
- Wind power

HEAVY INDUSTRIAL
- Paper
- Shaker screens
- Marine propulsion
- Beam pumps
- Mining/off-road

GENERAL INDUSTRIAL
- Meat grinders
- Plastic extrusion
- Shredders
- Mixers
GLOBAL MANUFACTURING AND REPAIR LOCATIONS

MILWAUKEE GEAR™, JAURE™ & KOP-FLEX® engineered couplings are designed, manufactured, sold and serviced worldwide, with service provided from specification right through to installation.

All MILWAUKEE GEAR, JAURE & KOP-FLEX facilities around the globe are state of the art, with access to a large and experienced engineering staff focused on providing solutions for our customers’ requirements.

A dedicated global sales and service team assists you to find the best choice and manage all your coupling needs.

Milwaukee, WI  USA
Kop-Flex HP Florence, KY  USA
Rexdale / Toronto, Canada
Apodaca, México
APPLICATION CONSIDERATIONS

The proper selection and application of power transmission products and components, including the related area of product safety, is the responsibility of the customer. Operating and performance requirements and potential associated issues will vary appreciably depending upon the use and application of such products and components. The scope of the technical and application information included in this publication is necessarily limited. Unusual operating environments and conditions, lubrication requirements, loading supports, and other factors can materially affect the application and operating results of the products and components and the customer should carefully review its requirements. Any technical advice or review furnished by Regal Beloit America, Inc. and/or its affiliates (“Regal”) with respect to the use of products and components is given in good faith and without charge, and Regal assumes no obligation or liability for the advice given, or results obtained, all such advice and review being given and accepted at customer’s risk.

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