

# MAXTORQUE High-Performance Worm Gears

Manual, Motorized and Subsea Solutions

TECHNOLOGY



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Limerick,  
Maine,  
USA

Cameron is a leading provider of flow equipment products, systems and services to worldwide oil, gas and process industries. We offer products primarily used to control, direct and measure the flow of oil and gas as it is moved from individual wellheads through flowlines, gathering lines and transmission systems to refineries, petrochemical plants and industrial centers for processing.

Cameron is a complete systems solution supplier, delivering new levels of efficiency and cost savings to our customers due to our full in-house capability to provide controls engineering and manufacturing together with choke, actuation and automation expertise, as well as project management, system engineering, operability and training.

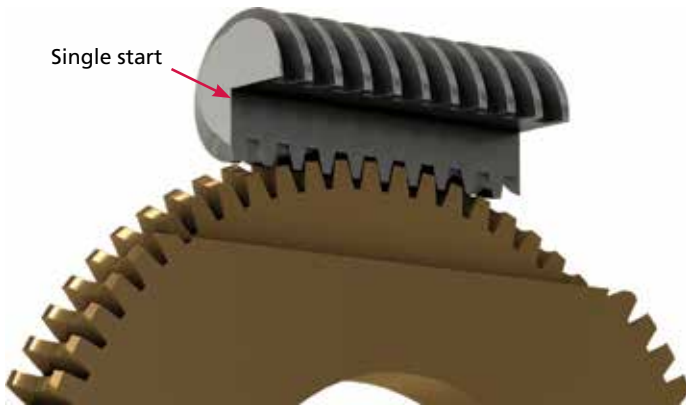
Cameron's MAXTORQUE™ gears feature patented AutoLock® technology that allows for high-performance worm gear solutions with the self-locking characteristics of conventional gearboxes. This means less work is required to actuate valves, leading to an improved HSSE profile and worker efficiency on manual valves and smaller actuators on motorized valves.

Our MAXTORQUE gear technology offers value-based solutions for a broad range of applications – from manual to motorized – and in the most challenging environments – from subsea to arctic.

## MAXTORQUE High-Performance Worm Gears

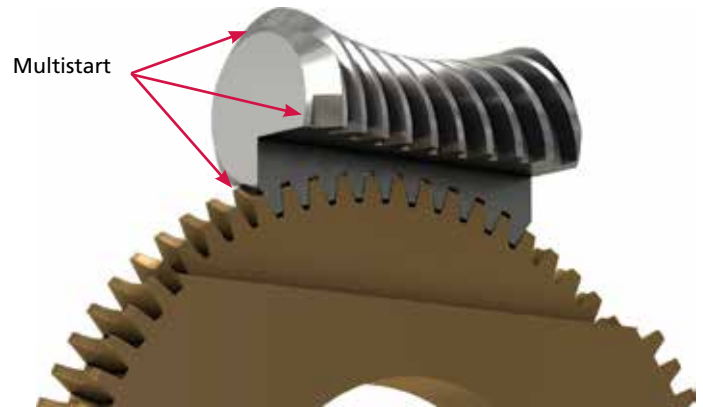
PERFORMANCE – BETTER TECHNOLOGY

### High-Efficiency, Double-Enveloping Worm Gears



**Standard Worm Gears**

1.23 to 2.98 teeth in contact



**MAXTORQUE™ Worm Gears**

6 to 13 teeth in contact

#### MAXTORQUE Features

- Efficiencies 2 to 2.5 times commodity gears
- Self-locking design
- Double-enveloping gear set
- Unique tooth form to reduce microscopic stresses
- Superior sealing system
- Capable of handling torques in excess of 1,000,000 ft-lb

#### MAXTORQUE Benefits

- Reduces work by up to 75%
  - Reduces turns, handwheel size and rim pull
  - Reduces stroke time
- Improves HSSE profile
- Reduces need for actuators
- Smaller MOV packages reduce cost and weight
- Quick stroke times where required
- Near-zero backlash for process control
- Ingress protection rating IP 68
- Features increased durability

### TYPICAL SAVINGS

Gear Requirements for 600# Trunnion Ball Valves – Manual Solution

Valve Size (in.)	Cameron Part Number	Torque with 1.25 SF	Handwheel Diameter (in.)	Break Rim Pull (lb)	Turns-to-Close MAXTORQUE Technology	Turns-to-Close Conventional Technology	Turn Reduction
24	BW1-156	180,650	36	79	40	190	150
30	BW2-312	327,175	36	62	98	297	199
36	BW3-470	478,800	36	75	118	297	179



## QUALITY – RELIABILITY BY DESIGN

Rugged ductile iron or carbon steel housing

Double sealed (IP68)

Gear set adjustable to near-zero backlash

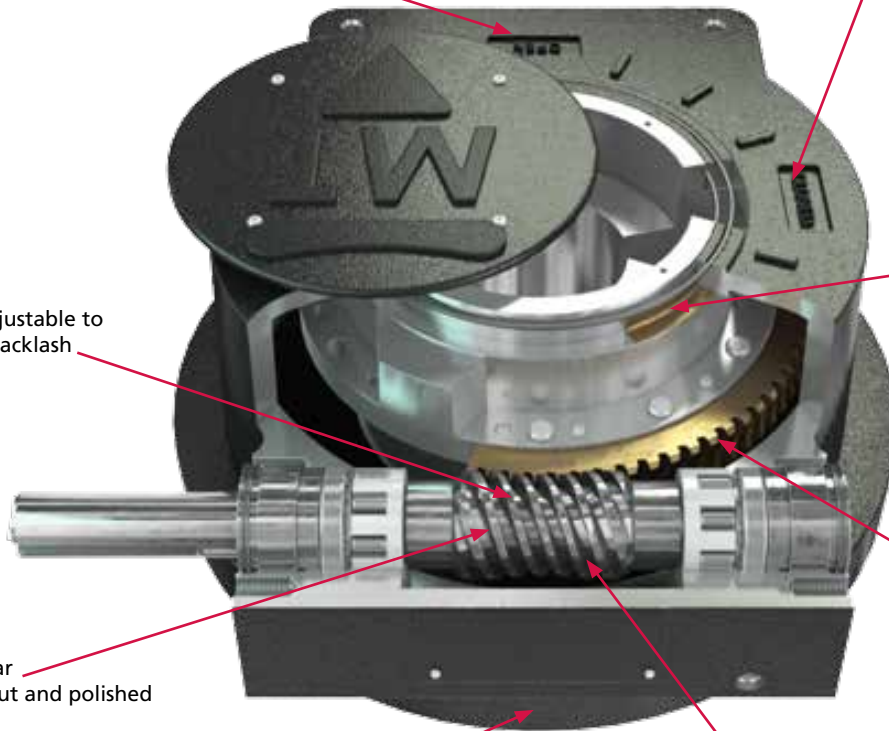
Bronze output bearings

Worm gear  
4140 HT cut and polished

Bronze alloy gear

Modular direct mount base

High-efficiency, multistart, double-enveloping worm gear



### Robust Design and Testing

- Rigorous PC/PLC cycle testing and qualification
- Best-in-class materials of construction
- Bronze output bearings to prevent galling
- Use of roller bearing instead of traditional/conventional plain/needle bearings
- ATEX/CE certified
- Compliant to AWWA, Mil Spec, ISO 9001:2000
- Made in the USA



## MOTORIZED, MANUAL, SUBSEA AND SPECIALTY APPLICATIONS



### Motorized/Process Control

- Smaller actuators
- Faster operating times
- Dependability in demanding environments
- Near-zero backlash for exacting control



### Manual

- Improves HSE by significantly reducing turns and rim pull
- Reduces requirement for actuators, thus reducing project cost and complexity
- Smaller operators and handwheels where size and weight are a premium



### Specialty

- Engineering-based creative solutions
- Custom, specialty requirements
- Harsh or challenging environments
- Military and naval standard and specialty operators



### Subsea

- Quality and performance where it matters most
- Independent hyperbaric testing for ultra-deepwater applications
- Support or ancillary equipment, including panels, spools and retrievable systems



### Ultra-large

- Supplied to 1,000,000 ft-lb (1,355,000 N·m)
- Scalable to 1,500,000 ft-lb (2,000,000 N·m)
- Mechanical option to large hydraulic and electrohydraulic actuators

# CAMSERV Services for Actuation and Valves

WE BUILD IT. WE BACK IT.



## Startup and Commissioning

Our experts understand that each project is unique. That's why Cameron's CAMSERV™ services help facilitate commissioning and startup activities.

- Integrated solutions, onsite or at our global service centers
- Increased equipment and product performance
- The shortest possible trouble-free startup for your critical assets



## Spare Parts and Asset Management

Cameron offers the assets and expertise to cover all aspects of valve management.

- Full inventory of quality exact OEM parts and spares
- Complete asset risk and criticality assessments
- Comprehensive inventory of your assets, including a complete recommended spare valves and parts list



## Operational Support

Cameron's ability to address valve requirements in the field is a reflection of our commitment to life-of-asset support.

- Innovative asset management solutions
- Trouble-free installation, startup and operations
- Support from commission to operation – extending through all phases of a valve's life cycle
- Extensive inventory of spare valves and parts

Cameron's CAMSERV site management mitigates the risk of project delays by identifying issues in the construction process prior to valve installation to ensure valve integrity.



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Learn more about MAXTORQUE High-Performance Worm Gears:

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#### **HSSE Policy Statement**

At Cameron, we are committed ethically, financially and personally to a working environment where no one gets hurt and nothing gets harmed.