

Gates® CARBON DRIVE™



UNCHAIN YOUR RIDE

PERSONAL MOBILITY DRIVE SOLUTIONS





GATES HISTORY OF PROVEN DRIVETRAIN TECHNOLOGY ADVANCEMENTS FOR MOBILITY



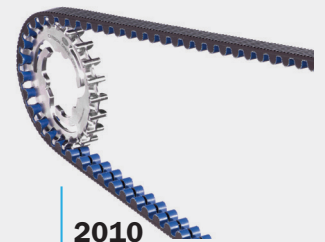
1911
FOUNDED
DENVER, CO



1942
CO-DEVELOPED
SYNTHETIC RUBBER
MASS PRODUCTION



1986
INTRODUCED
REVOLUTIONARY
POLY CHAIN
SYNCHRONOUS BELT



2010
GATES LAUNCHES
CARBON DRIVE
CENTERTRACK™

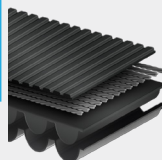
1917
INVENTED
V-BELTS



1980
ENGINEERED AND
DEVELOPED BELTS
TO REPLACE CHAINS
ON MOTORCYCLES



2006
POLY CHAIN
GT CARBON
BELT



2007
GATES CARBON DRIVE
LAUNCHES
FIRST BICYCLE
BELT DRIVE SYSTEM



In 2012 Frank Schneider conquers
Alpe D'huez Megavalanche Cup

GATES CORPORATION IS A LEADING MANUFACTURER OF APPLICATION-SPECIFIC POWER TRANSMISSION AND FLUID POWER SOLUTIONS. WE ARE DRIVEN TO CONTINUALLY PUSH THE BOUNDARIES OF MATERIALS SCIENCE TO ADVANCE THE WAY THE WORLD MOVES.

Gates belts are driving a revolution in personal and micromobility that is transforming how the world gets from A to B. From two-wheelers to four-wheelers, ICE or electric, we deliver belt drive solutions and engineering support to rapidly move your projects from concept to reality.

Our highly trained application engineers work with you from inception to completion, optimizing your design, selecting the ideal drivetrain products, and delivering a power transmission solution that exceeds performance goals for efficiency, durability, and customer satisfaction.



2012
GATES LAUNCHES
CARBON DRIVE
CRANKSETS



2020
GATES LAUNCHES
SIDETRACK



2022
GATES CARBON DRIVE
15TH ANNIVERSARY

GATES LAUNCHES
MOTO X5
MOTO XF



2019
GATES GLOBAL MOBILITY &
G-FORCE REDLINE LAUNCH



2021
GATES MOTO X9 INTRODUCED
MOTO X9



2022
GATES LAUNCHES CDC
CENTERTRACK BELT

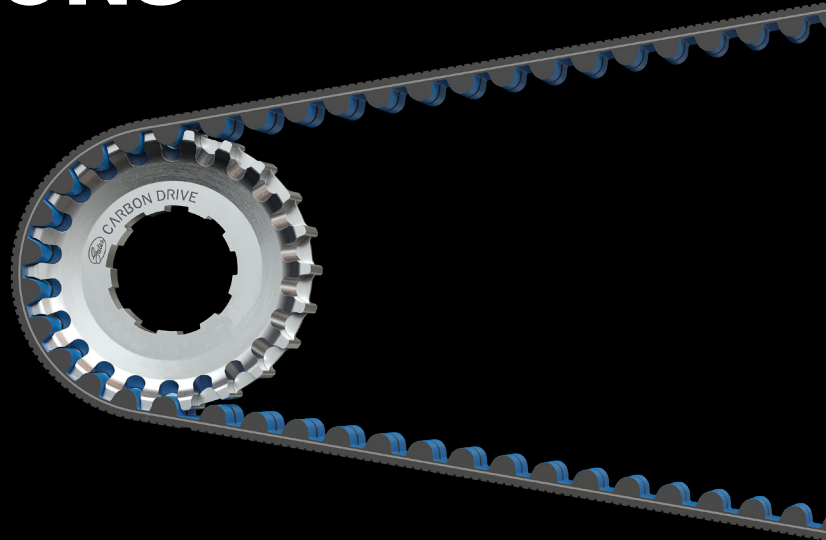




PERSONAL MOBILITY DRIVE SOLUTIONS

NEW PRODUCTS

- MOTO X9 BELTS
- MOTO X5 BELTS
- MOTO XF SPROCKETS
- CENTERTRACK SPROCKETS
- MUDPORT SPROCKETS



WORKING WITH GATES CAN HELP YOU ACHIEVE:

- ELIMINATION OF METAL-ON-METAL CHAIN CLATTER
- CORROSION RESISTANCE
- REDUCED MAINTENANCE
- INCREASED DURABILITY
- IMPROVED EFFICIENCY
- WEIGHT REDUCTION
- HIGHER SPEEDS AND TORQUE
- GREATER POWER AND LOAD
- CLEANER DRIVES



NEXT GENERATION DRIVE BELT FOR MOTORCYCLES AND SCOOTERS

Gates most advanced drive belt combines our latest technologies in tooth profile design, polyurethane belt compound, carbon tensile cord, and belt construction – creating our narrowest drive belt for motorcycles and scooters.

Carbon Drive Moto X9 delivers extraordinary performance while retaining Gates legendary long lasting and low maintenance characteristics.



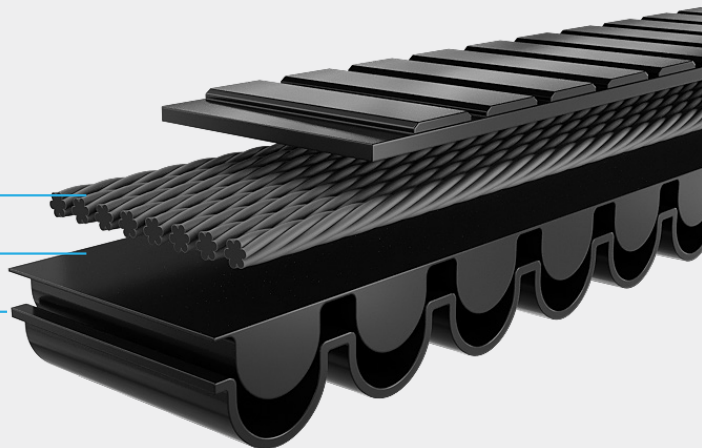
AVAILABILITY: OE ONLY

BELT CONSTRUCTION

CARBON-FIBER CORD

POLYURETHANE COMPOUND

NYLON WEAR-LAYER



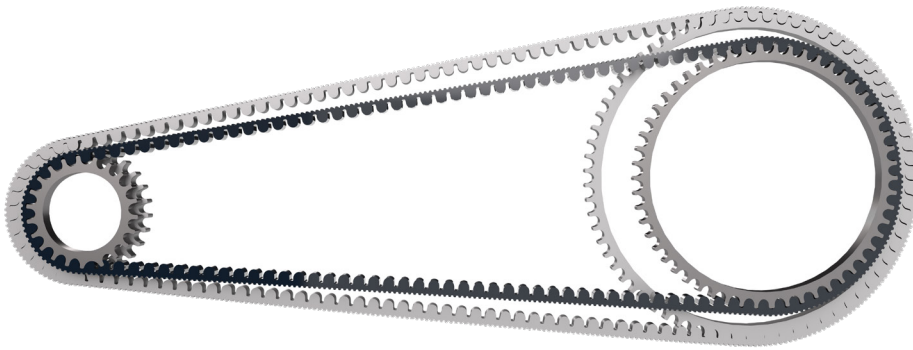
**LEANER.
LIGHTER.
STRONGER.**

Carbon Drive Moto X9 advanced **11mm** construction creates drive flexibility with significant advantages over previous generations of both 14mm and 8mm pitch belts.

[GatesCarbonDrive.com/MotoX9](https://www.gates.com/MotoX9)

DRIVE BENEFITS ACHIEVABLE WITH CARBON DRIVE MOTO X9

SMALLER DRIVE PACKAGE

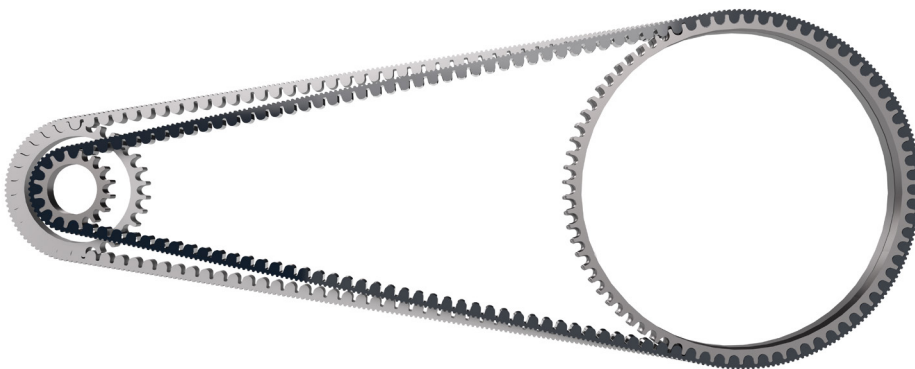


Reduced Sprocket Diameters (20t DriveR Minimum)
Less Weight - Material Dependent



Narrower Belt Width

DRIVE RATIO FLEXIBILITY

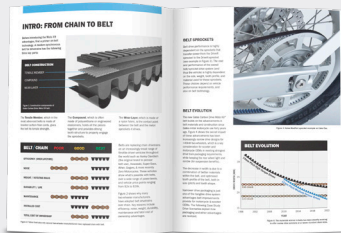


Increased Torque
Eliminate Gear or Reduction Drives for Electric Motors

LONGER LIFE

UP TO
84%

Under Same
Load Conditions



Visit [GatesCarbonDrive.com/MotoX9](https://www.gatescarbondrive.com/MotoX9) to view our webinar and download our white paper to learn about the advantages Moto X9 belts bring to scooter and motorcycle applications, specifically related to the drivetrain weight and packaging, vehicle torque, and drivetrain longevity.



Gates® CARBON DRIVE MOTO X5

PHOTO COURTESY OF AEON MOTOR

INTRODUCING MOTO X5

NEW DESIGN ENABLES QUIETER AND MORE EFFICIENT DRIVETRAINS

The innovative Moto X5 belt is a significant addition to the Gates Carbon Drive portfolio as it offers the same core belt drive benefits of Clean, Quiet, Smooth, Strong, but with even quieter performance than its predecessors.

Gates achieved this breakthrough in belt technology through the combination of a high-stiffness, long-lasting synthetic compound with Gates long-proven carbon-fiber cord reinforcement. The combination not only provides durability and strength, it also results in the quietest Carbon Drive belt yet. Independent lab testing by AVL combined with Gates internal testing shows Moto X5 is up to 15 decibels quieter than chain over a range of vehicle speeds.

Additionally, throughout the life of the vehicle and under normal operating and maintenance conditions, Moto X5 is more energy efficient than chain, which can lead to improved vehicle range, a critical factor on electric vehicle applications.

The Gates Carbon Drive Moto X5 product line is designed specifically for mid-motor sit-down electric scooters and motorcycles typically found in commuting applications in the rapidly evolving Asian market.

AVAILABILITY: OE ONLY

MOTO X5 COMPONENTS

BELT CONSTRUCTION

CARBON HD TENSILE CORD

High performance / stretch resistance

NEXT GEN SYNTHETIC COMPOUND

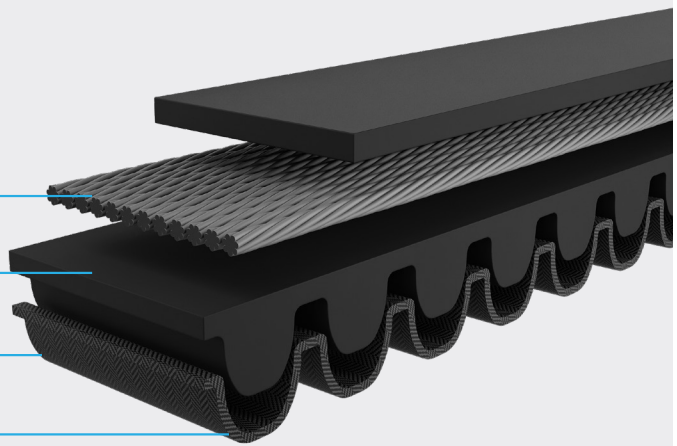
High strength / high stiffness

NEW NYLON TOOTH FABRIC

Improved abrasion resistance

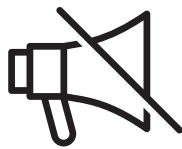
8M GT TOOTH PROFILE

Backward compatible with
Moto X9 8M sprockets



CLEAN

No lube.
No rust. Ever.



QUIET

Our quietest belt yet.
Up to 15 decibels (dB(A))
lower than chain.



SMOOTH

Higher efficiency
than chain over life
of the vehicle.



STRONG

High-stiffness long-lasting
synthetic compound
teeth with Gates
long-proven carbon-fiber
cord reinforcement.



NEW MOTO-XF FRONT SPROCKET LINE FOR MOTORCYCLES & SCOOTERS

BENEFITS

- Fast: prototype in 2-3 weeks
- Wide range of sprocket configurations, including custom splines, single or dual flange, and offset variations (Configuration options below)
- High-durability carbon steel (~120k km typical)
- Corrosion coating options dependent on application or environmental requirements
- Most cost-effective option at both low and high volume
- Low MOQ



TECHNICAL SPECIFICATIONS

MATERIAL	POWDERED METAL
COATING*	BLACK E-COATING
HARDNESS	> 70 HRB > 100 HRB UPON REQUEST

*Other options available upon request

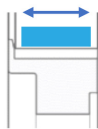
PITCH AND TOOTH COUNTS



11M
11M-20T
11M-21T
11M-22T
11M-24T

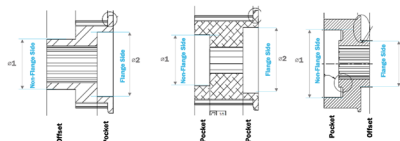
8M
8M-22T
8M-24T
8M-25T

BELT WIDTH RANGE



8MM: 10-36mm
11MM: 12-36mm

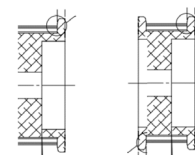
OFFSET



NON-FLANGE SIDE
Offsets (Positive) or Pockets (Negative)

FLANGE SIDE
Offsets (Positive) or Pockets (Negative)

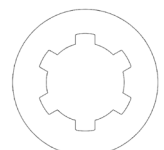
FLANGE



SINGLE OUT
Single flange built in; welded second flange optional

DUAL

SHAFT INTERFACE



Available with Involute Spline, Straight 6 Spline, Keyways, Plain Bore



MUDPORT SPROCKET DESIGN



SPECIFICATIONS

- Patent pending port design for debris-shedding
- Available in 11mm pitch
- Optimized tooth profile for smooth performance
- Single or Double flange options
- Significantly decreased noise and maintenance compared to chains

Gates Carbon Drive MudPort™ innovation delivers a belt-drive system for scooters and motorcycles that is expected to increase lifetime in high-debris riding conditions while reducing weight vs. standard sprocket designs.

MudPort is compatible with the entire line of Gates Carbon Drive 11mm pitch polyurethane scooter and motorcycle belts and comes in a range of widths and diameters to fit most two-wheel applications.

Learn more about Gates motorcycle and scooter drive solutions, or schedule your application review with one of our engineers at:

[Gates.com/Mobility](https://www.gates.com/mobility)



GATES ADVANCED SPROCKET DESIGNS SHED DEBRIS



CENTERTRACK SPROCKET DESIGN



SPECIFICATIONS

- Sprocket Width reduction (5mm+)
- Sprocket Weight reduction (up to 10%)
- Equivalent Belt Life to Standard Belt Drive

CENTERTRACK BELT SYSTEMS NOW ENABLE OFF-ROAD APPLICATIONS

Gates has now expanded the proven Carbon Drive bicycle sprocket technology for wider belt applications of motorcycles and scooters. This new CenterTrack design delivers all the benefits of belt drive plus the debris-shedding off-road capabilities previously associated only with chain.

Elimination of the standard outer flanges reduces system width, weight, and cost.

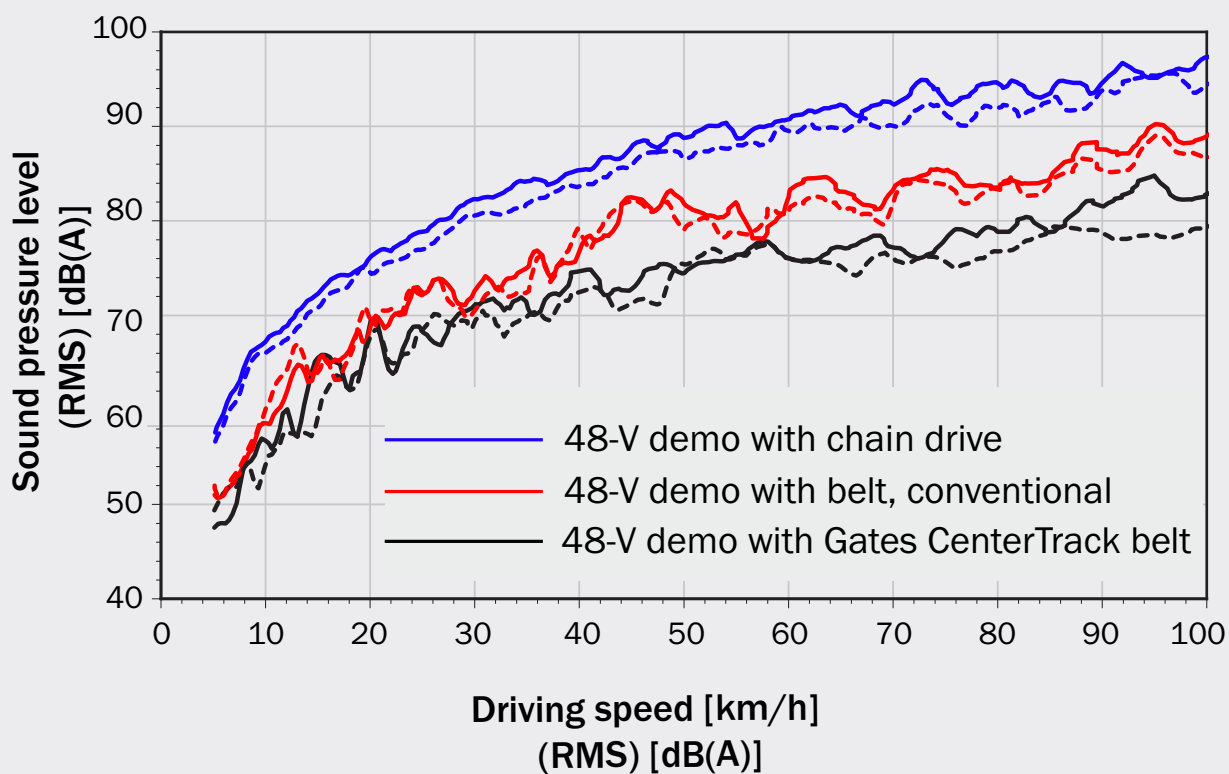


NOISE ADVANTAGE OF BELT VS. CHAIN PUBLISHED

The acoustics of an electric motorcycle - and Gates innovative solutions impact on such - were 3rd-party evaluated and published in the July 2022 issue of ATZ Worldwide Magazine.

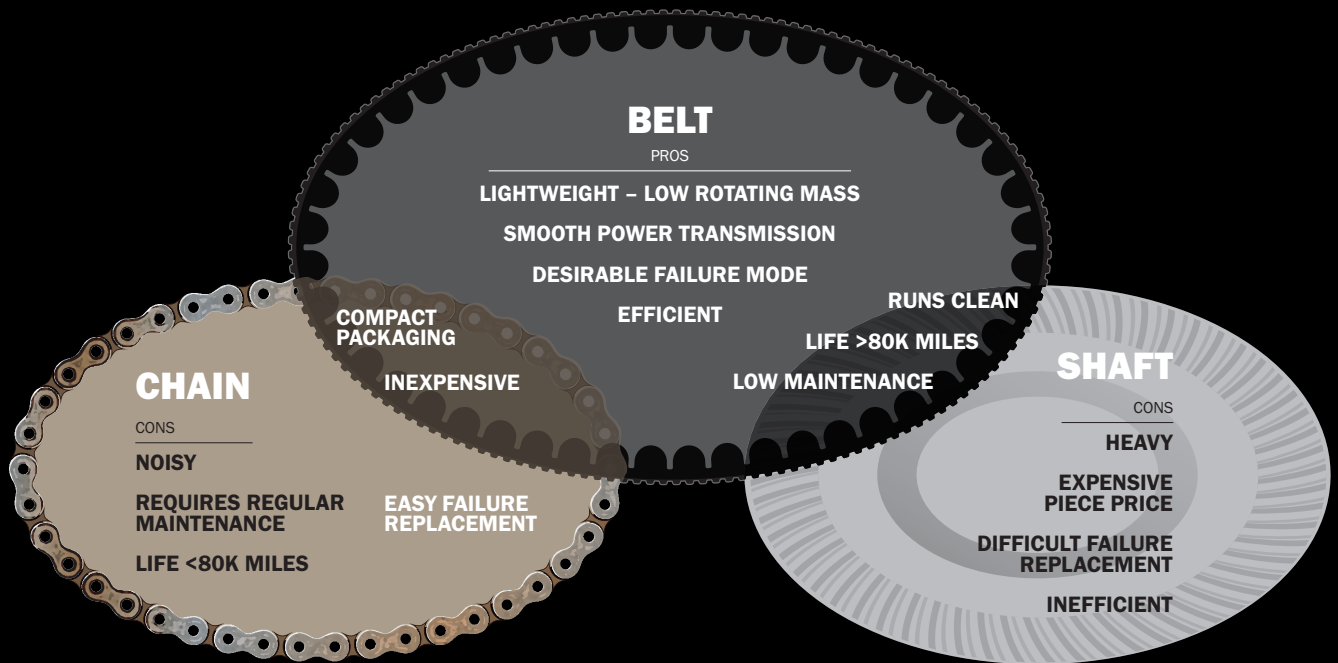
Specifically, the test completed an acoustic comparison of 3 different powertrain concepts: chain, belt (with side flange sprockets), and belt (with CenterTrack sprockets).

As expected, chain delivered the highest levels of the 3, with the Gates CenterTrack solution improving on the quieter levels of the belt (flange) solution.



[READ MORE](#)

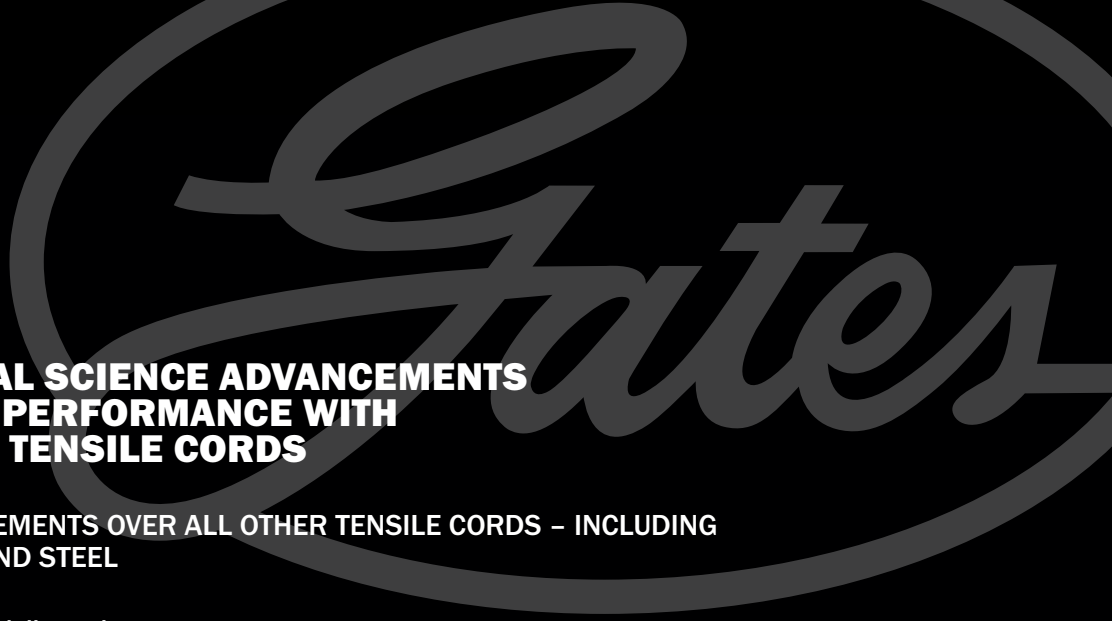
GATES BELT DRIVE SYSTEMS IMPROVE UPON THE BEST CHARACTERISTICS OF BOTH CHAIN AND SHAFT OPTIONS



GATES BELT DRIVE SYSTEMS OUTPERFORM CHAIN WITHIN 2-WHEEL PERSONAL MOBILITY



MANUFACTURER PRIORITIES	POOR	GOOD	BEST
EFFICIENCY (OVER LIFETIME)			
NOISE			
WEIGHT / ROTATING MASS			
DURABILITY / LIFE			
MAINTENANCE			
INSTALLED COST			
TOTAL COST OF OWNERSHIP			



GATES MATERIAL SCIENCE ADVANCEMENTS IMPROVE BELT PERFORMANCE WITH CARBON FIBER TENSILE CORDS

SIGNIFICANT IMPROVEMENTS OVER ALL OTHER TENSILE CORDS – INCLUDING
ARAMID (KEVLAR®) AND STEEL

- High power density delivers the most compact and lightweight drive designs
- High flex fatigue resistance – exceeding steel, glass, and aramid fibers
- High modulus & dimensional stability – negligible elongation, keeping pitch fit constant at various loads
- High strength-to-weight ratio
- Low noise
- Environmental resistance – no degradation from water, oil, most contaminants

DuPont™ and Kevlar® are trademarks or registered trademarks of E.I. du Pont de Nemours and Company.

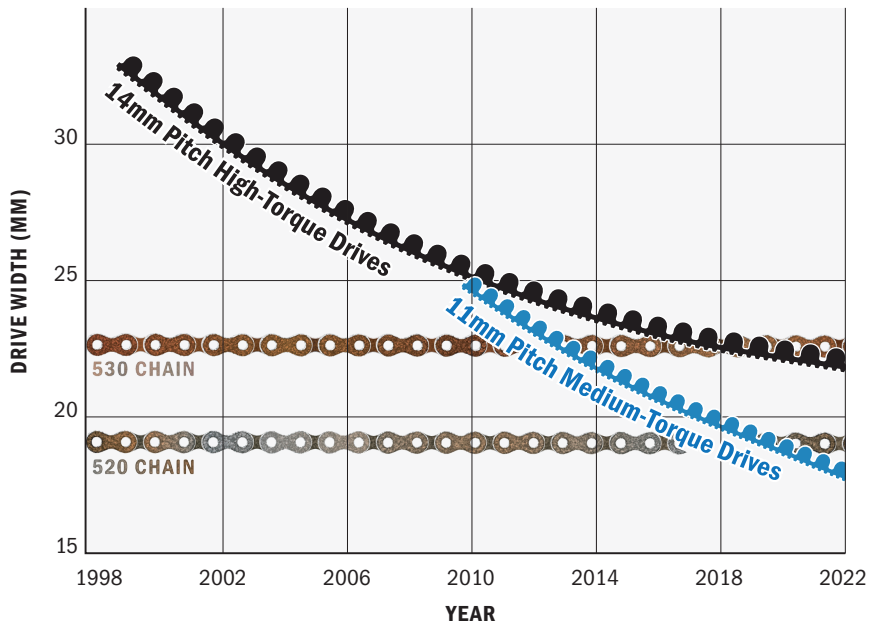
BELT DRIVE EVOLUTION

Gates enjoys a 40+ year history in motorcycle drives – introducing our first drive belt in 1980 with continuous belt construction advancements creating narrower belt widths.

First carbon tensile cord motorcycle drive belt in 2003

Introduced in 1999, Gates 14mm pitch high-torque belts are now narrower than 530 chain

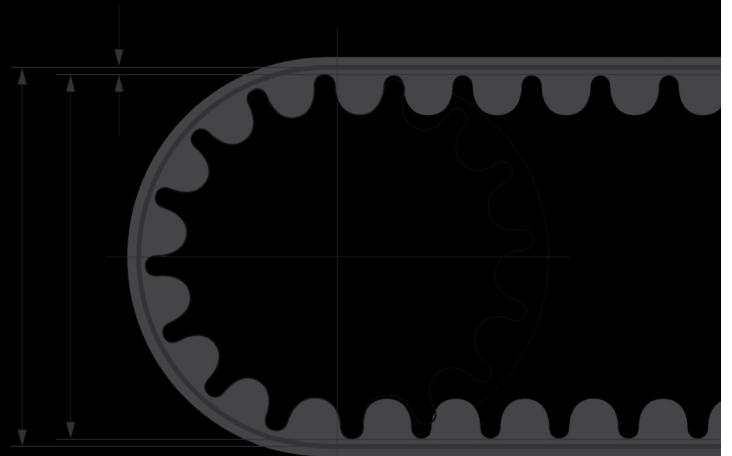
Launched in 2010, our 11mm pitch medium-torque belts, now in **Moto X9 construction**, rival 520 chain width





DRIVEN BY POSSIBILITY™

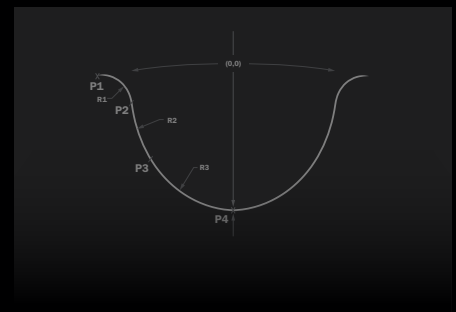
MEETING YOUR DESIGN NEEDS AT EVERY TURN



Partner with Gates early in your design to extend your engineering team and expand your power transmission experience to achieve the right balance between performance and cost effectiveness. We start by understanding:

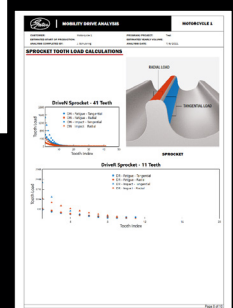
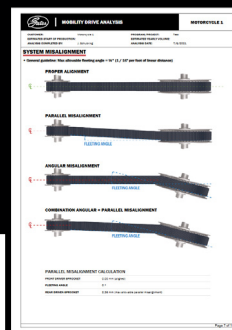
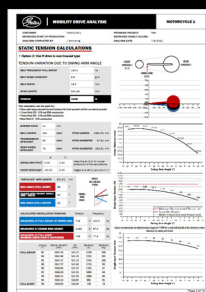
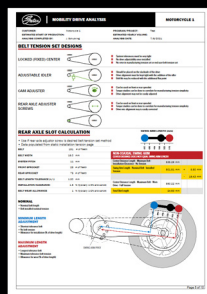
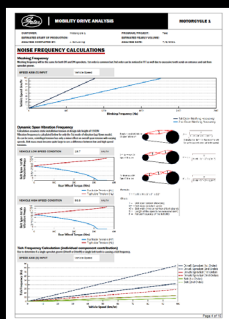
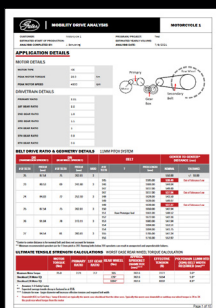
- How does your design move, operate, and function?
- What temperatures, environments, fuel efficiency, loads, or power demands will your system require?
- What type of service, maintenance, and support is required to meet your market demand?

From there, we apply our proprietary software tools to optimize your drivetrain design,



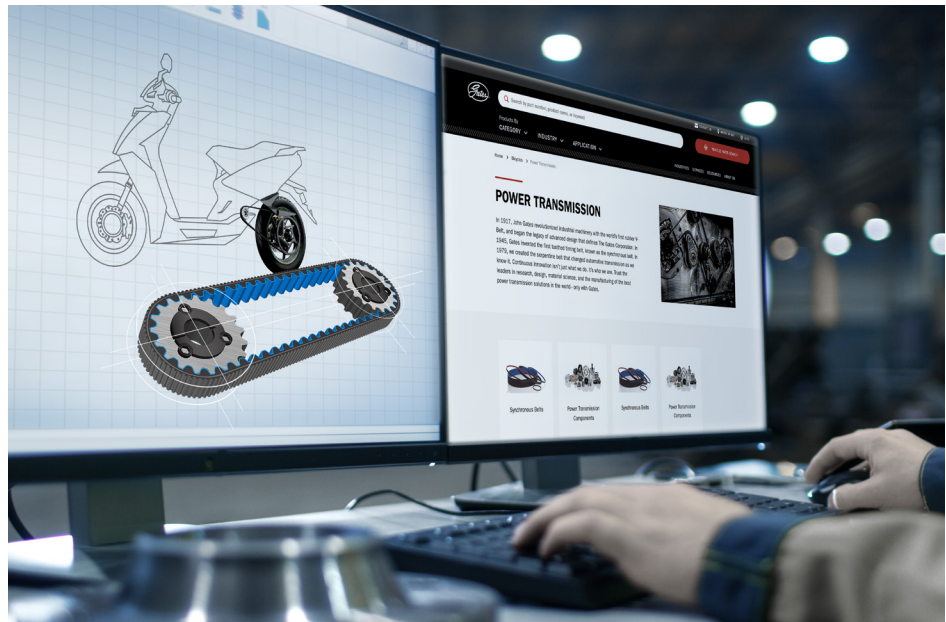
GATES DESIGN POWER

Gates innovative and industry-first Mobility Drive Analysis tool makes it easier for engineers from bicycle, scooter, motorcycle, and power sports OEMs to design Gates clean, quiet, durable and low-maintenance Carbon Drive belt systems into their next-generation vehicles, further accelerating conversion from chain and other technologies.



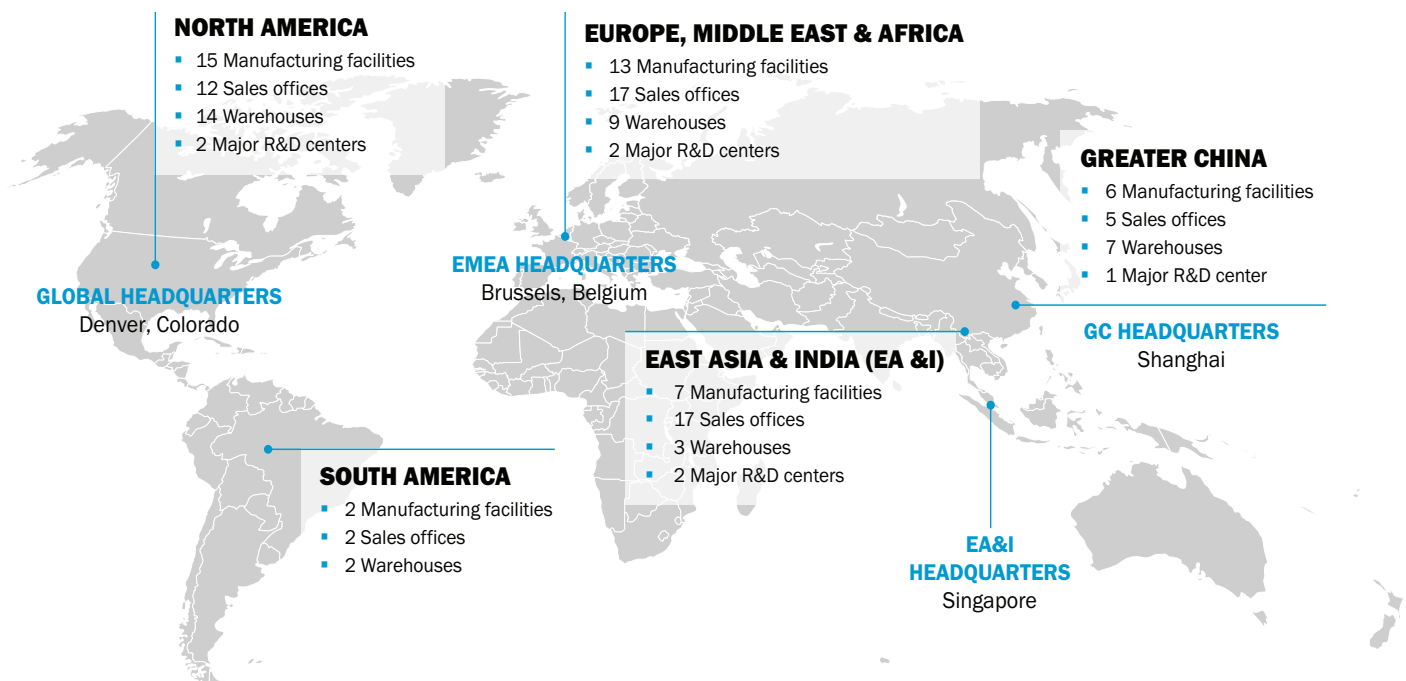
GLOBAL ENGINEERING DESIGN & SUPPORT

- **Drive System Design**
 - Advanced Systems Engineering
 - Component Modeling and Design
- **Drive System Validation**
 - Clarify System Targets
 - Product Testing Assistance
 - Drive Improvement Analysis
- **VA/VE Analysis**
 - Evaluate Opportunities to Improve Drive System
 - Supply Chain Simplification
- **Global Project Coordination**
 - Seamless Global Collaboration to Completion
 - Global Sourcing Capabilities



GATES GLOBAL FOOTPRINT DELIVERS PRODUCT SUPPORT THROUGHOUT YOUR PRODUCTS LIFE-CYCLE: DESIGN, MANUFACTURING, AND AFTER-SALES

- In-Region / For-Region Manufacturing Strategy **13,500+** EMPLOYEES
- Local Commercial Teams Establish Close, Long-Term Customer Relationship **100+** LOCATIONS
- Global Market Coverage Within Established Channel Presence **128** COUNTRIES SOLD TO



GATES TECHNICAL ENGINEERING CENTERS AND TECHNICAL SALES OFFICES are located around the world to support your design, manufacturing, and after-sales efforts – get moving with Gates.



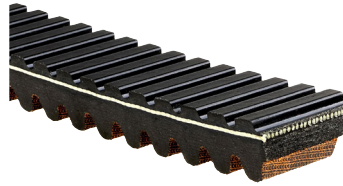
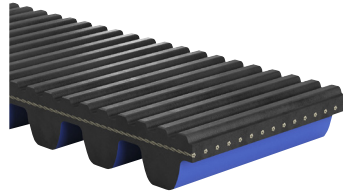
DRIVEN BY POSSIBILITY™

WIDEST PORTFOLIO IN THE INDUSTRY



BELTS

- Synchronous
- CVT Belts
- CAM Belts in Oil
- V-Belts



SPROCKETS

- CenterTrack or MudPort Debris-Shedding Designs
- Wear and Corrosion Resistance Coatings
- Paint and Finish Options
- Global Manufacturing and Assembly Capabilities



POWERSPORTS CVT BELTS

For our PowerSports belt solutions, visit [Gates.com/GForce](https://www.gates.com/GForce)



IDLERS & POWER TRANSMISSION COMPONENTS

- Pulleys
- Idlers and Tensioners
- Isolators – Cush Drive
- Accessory Drive Kits
- Water Pumps
- Electric Water Pumps



TOOLS

- EZ Align laser alignment tool
- Mobile tensioning app
- Sonic tension meter





GLOBAL ENGINEERING DESIGN & SUPPORT

Our highly trained application engineers work with you from inception to completion, optimizing your design, selecting the ideal drivetrain products, and delivering a power transmission solution that exceeds performance goals for efficiency, durability and customer satisfaction.

Contact us at [Gates.com/Mobility](https://www.gates.com/Mobility)



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